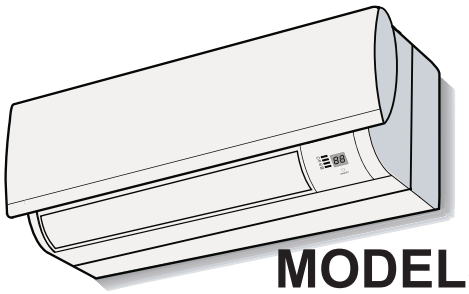
SHARP SERVICE MANUAL

SC213AYX9PSR/C

SPLIT TYPE ROOM AIR CONDITIONER



	INDOOR UNIT	OUTDOOR UNIT
MODELS	AY-X9PSR	AE-X9PSR
	AY-X12PSR	AE-X12PSR

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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PARTS LIST

Parts marked with " ⚠ " are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CHAPTER 1. PRODUCT SPECIFICATION

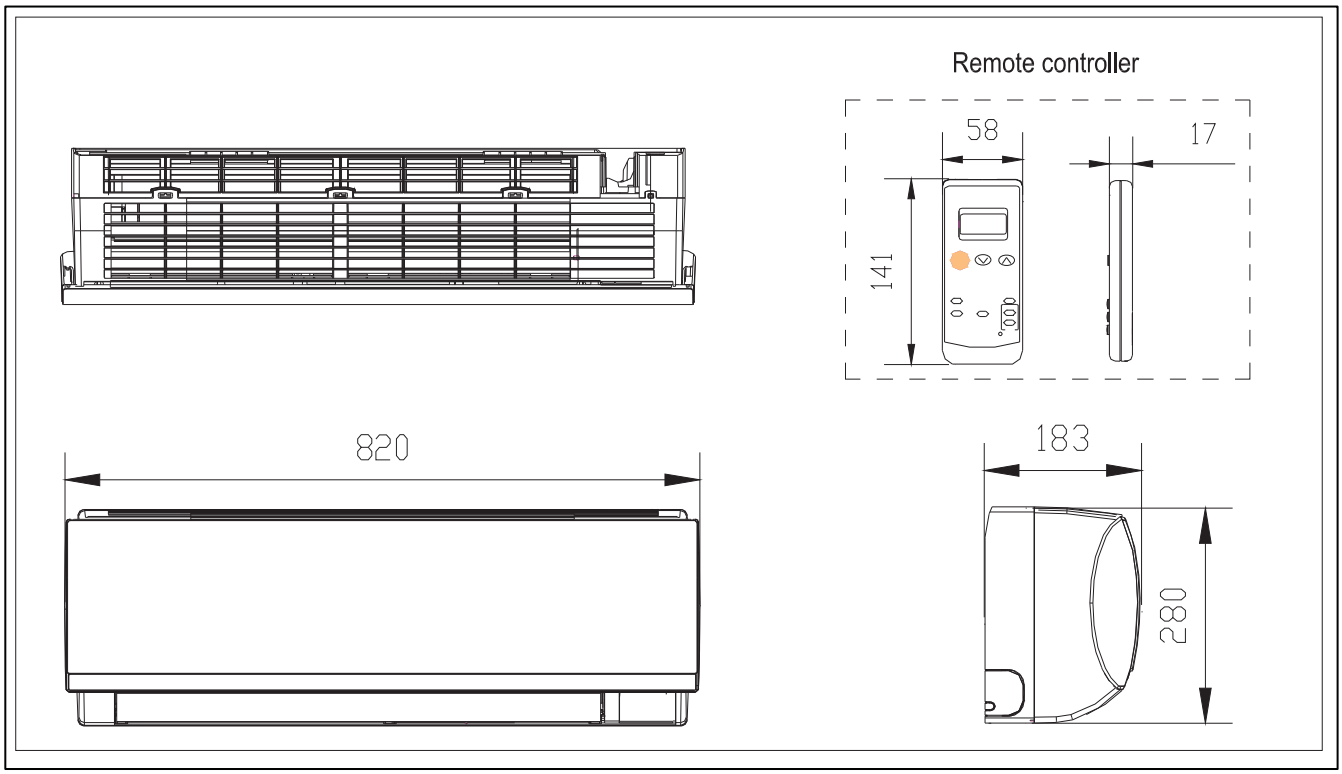
[1] SPECIFICATION

1. AY-X9PSR/AY-X12PSR

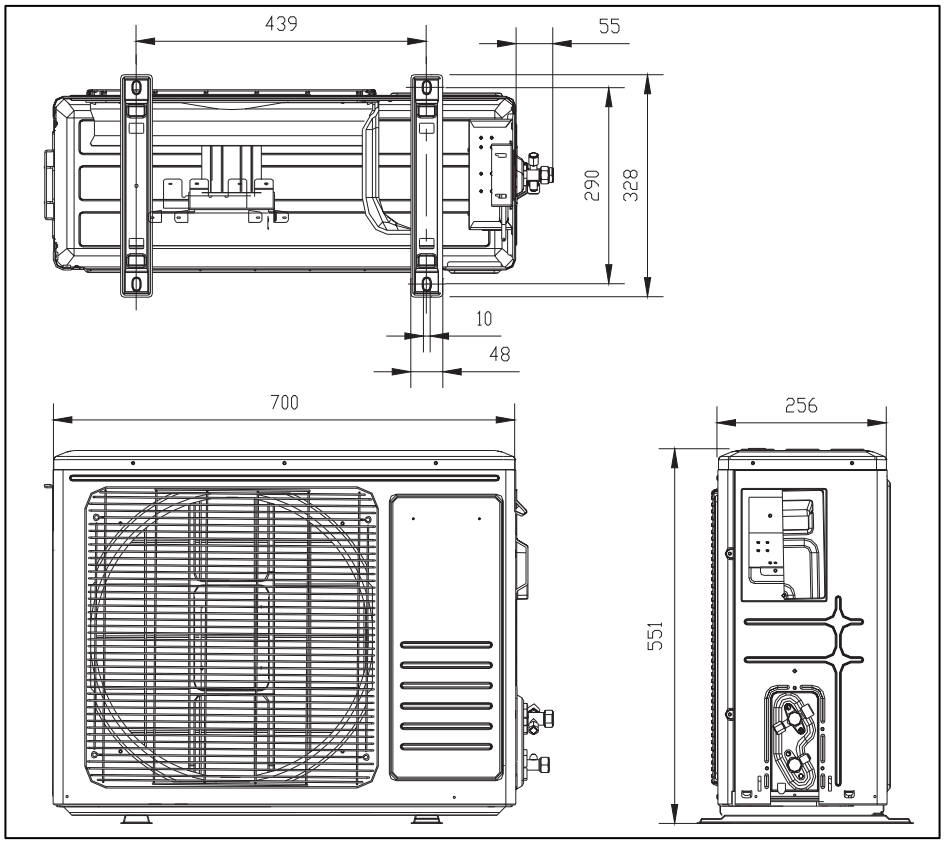
ITEMS		MODEL /	INDOOR UNIT AY-X9PSR	OUTDOOR UNIT AE-X9PSR	INDOOR UNIT AY-X12PSR	OUTDOOR UNIT AE-X12PSR
Rated cooling capacity(Min-Max)		kW	2.6(1.00-3.10)		3.5(1.1-3.7)	
Rated heating capacity(Min-Max)		kW	2.6(1.0-3.80)		3.5(1.1-4.5)	
Moisture removal(at cooling)		Liters/h	0.8		1.0	
Electrical date						
Phase			Single		Single	
Rated frequency		Hz	50		50	
Rated voltage		V	220-240		220-240	
Rated current(Min-Max)	Cool	A	3.5(1.32-5.0)		4.9(1.32-6.1)	
	Heat	A	3.1(1.32-6.4)		4.6(1.32-7.8)	
Rated input(Min-Max)	Cool	W	760(290-1100)		1060(290-1330)	
	Heat	W	680(290-1400)		1010(290-1700)	
Power factor	Cool	%	94		94	
	Heat	%	95		95	
Maximum operating current		A	6.4		7.8	
Compressor	Type		Hermetically sealed ROTARY TYPE		Hermetically sealed ROTARY TYPE	
	Model		DA89M1C-81EZ8		DA108M1C-81EZ8	
	Oil charge		370ml（ESTER OIL VG74）		370ml（ESTER OIL VG74）	
Refrigerant system	Evaporator		Louver fin and grooved tube type		Louver fin and grooved tube type	
	Condenser		Louver fin and grooved tube type		Louver fin and grooved tube type	
	Control		Microcomputer controlled reverse system		Microcomputer controlled reverse system	
	Refrigerant(R410A)		750		950	
	De-Ice system		Microcomputer controlled reverse system		Microcomputer controlled reverse system	
Noise Level(at cooling)	High	dB(A)	38	60	38	62
	Low	dB(A)	34	—	34	—
	Soft	dB(A)	26	—	26	—
Fan system						
Drive			Direct drive		Direct drive	
Air flow quantity(at cooling)	High	m3/min	11.0	31.7	11.0	28.3
	Low	m3/min	8.4	—	8.4	—
	Soft	m3/min	5.8	—	5.8	—
Fan			Cross flow fan	Propeller fan	Cross flow fan	Propeller fan
Connections						
Refrigerant coupling			Flare tpye		Flare tpye	
Refrigenrant tube size Gas,Liquid		inch	3/8",1/4"		1/2",1/4"	
Drain pipe		mm	O.Dφ16		O.Dφ16	
Others						
Safety device			Fan motor:thermal fuse		Fan motor:thermal fuse	
			Fuse,Micro compute control		Fuse,Micro compute control	
Air filters			Polypropylene net(washable)		Polypropylene net(washable)	
Net dimensions	Width	mm	820	700	820	700
	Height	mm	280	256	280	256
	Depth	mm	183	551	183	551
Net/Gross weight		kg	10/12	24/28	10/12	26/30

[2] EXTERNAL DIMENSION

INDOOR UNIT



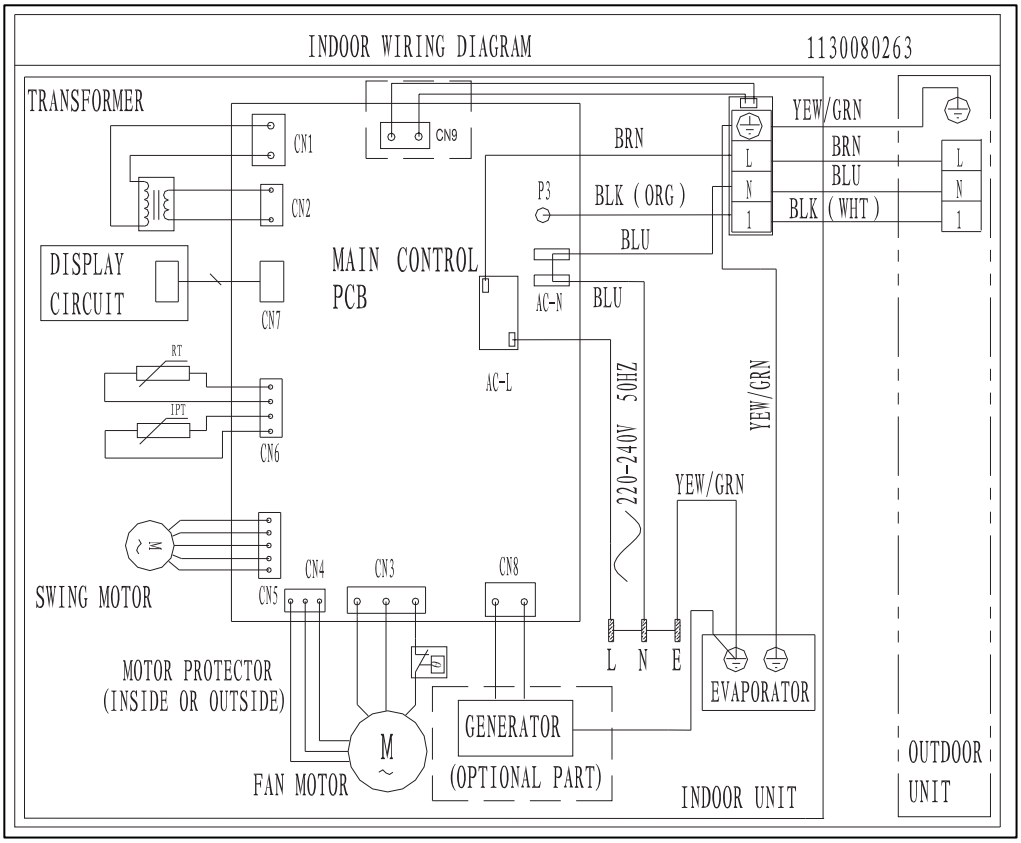
OUTDOOR UNIT



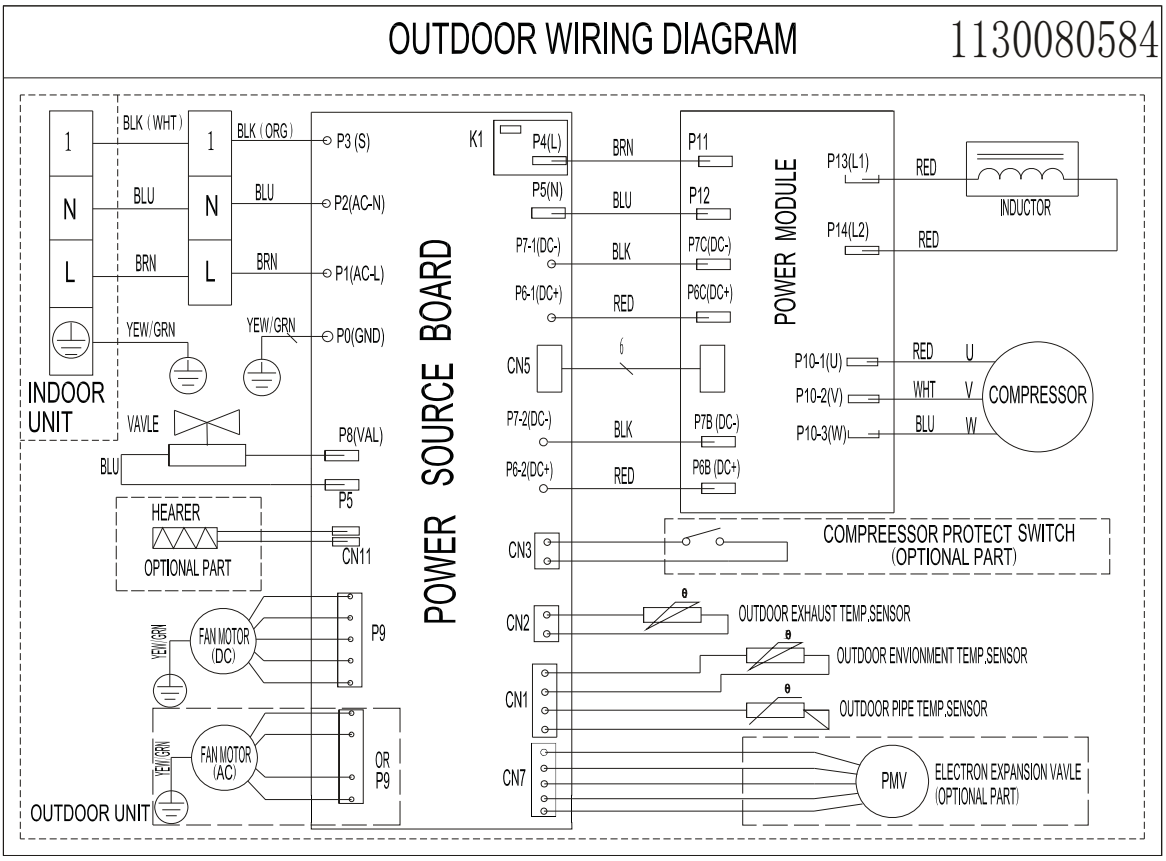
[3]WIREING DIAGRAM

1.AY-X9PSR/AY-X12PSR
AE-X9PSR/AE-X12PSR

Indoor unit



Outdoor unit



[4]ELECTRICAL PARTS

1.AY-X9PSR/AE-X9PSR

Indoor unit

DESCRIPTION	CODE	REMARKS
Indoor fan motor	1170030067	220V/50Hz
Main PCB	1090260049AA	
Display PCB	1090320292	
Transformer	1170240024	220V/50/60Hz，12V
Vane motor	1170020011	12V
Indoor sensor	1170230001	5kΩ

Outdoor unit

DESCRIPTION	CODE	REMARKS
Power source board	210900163	
Inverter module	210900026	
Inductor	1171990046	5.0mH，10A
outdoor fan motor	1170040126	220V/50Hz
Discharge Temp. sensor	1170230006	2.1kΩ
Pipe Temp. sensor and outdoor Temp. sensor	1170230007	5kΩ

2.AY-X12PSR/AE-X12PSR

Indoor unit

DESCRIPTION	CODE	REMARKS
Indoor fan motor	1170030067	220V/50Hz
Main PCB	1090260049AA	
Display PCB	1090320292	
Transformer	1170240024	220V/50/60Hz，12V
Vane motor	1170020011	12V
Indoor sensor	1170230001	5kΩ

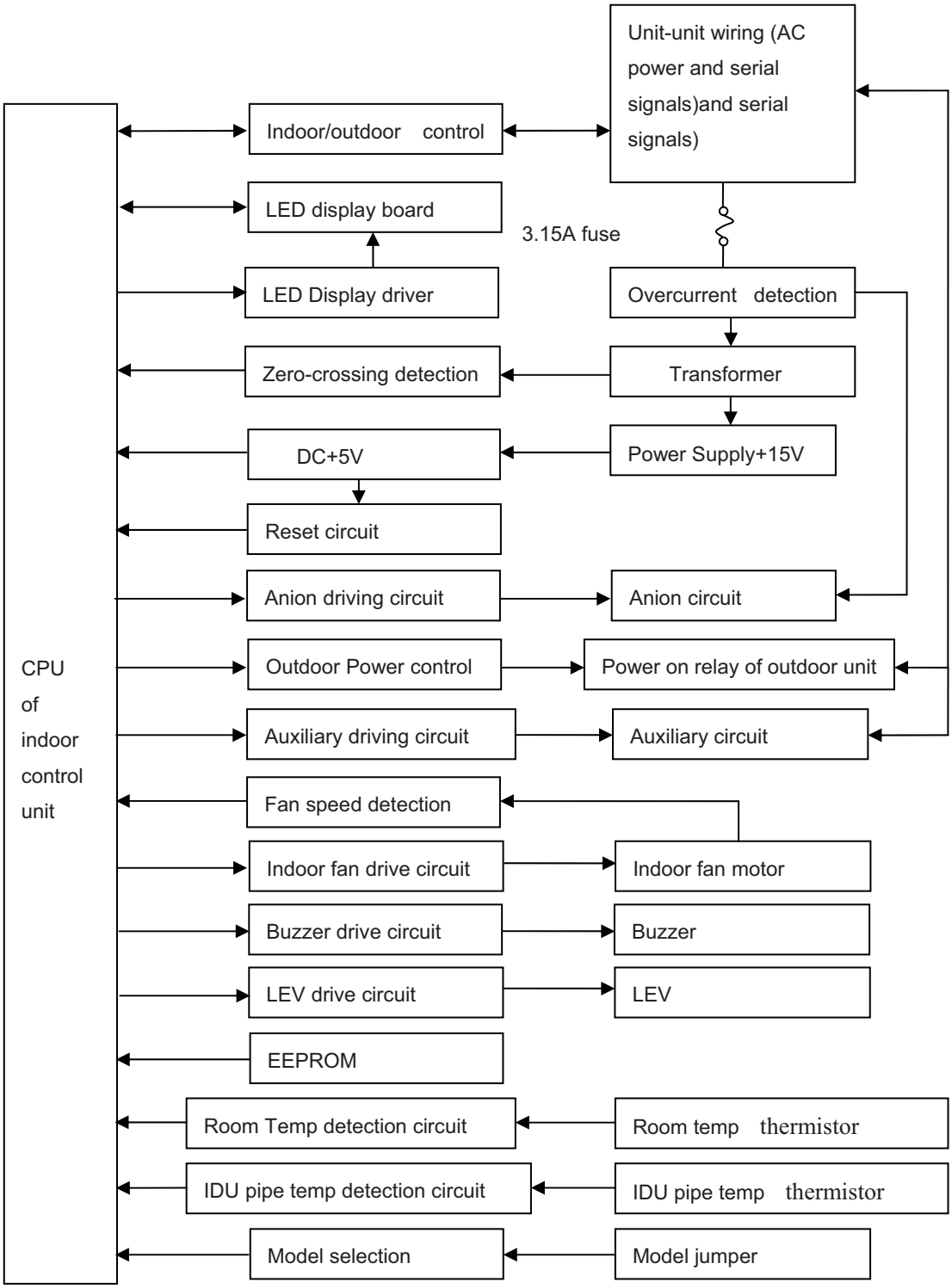
Outdoor unit

DESCRIPTION	CODE	REMARKS
Power source board	210900168	
Inverter module	210900026	
Inductor	1171990046	5.0mH，10A
outdoor fan motor	1170040126	220V/50Hz
Discharge Temp. sensor	1170230006	2.1kΩ
Pipe Temp. sensor and outdoor Temp. sensor	1170230007	5kΩ

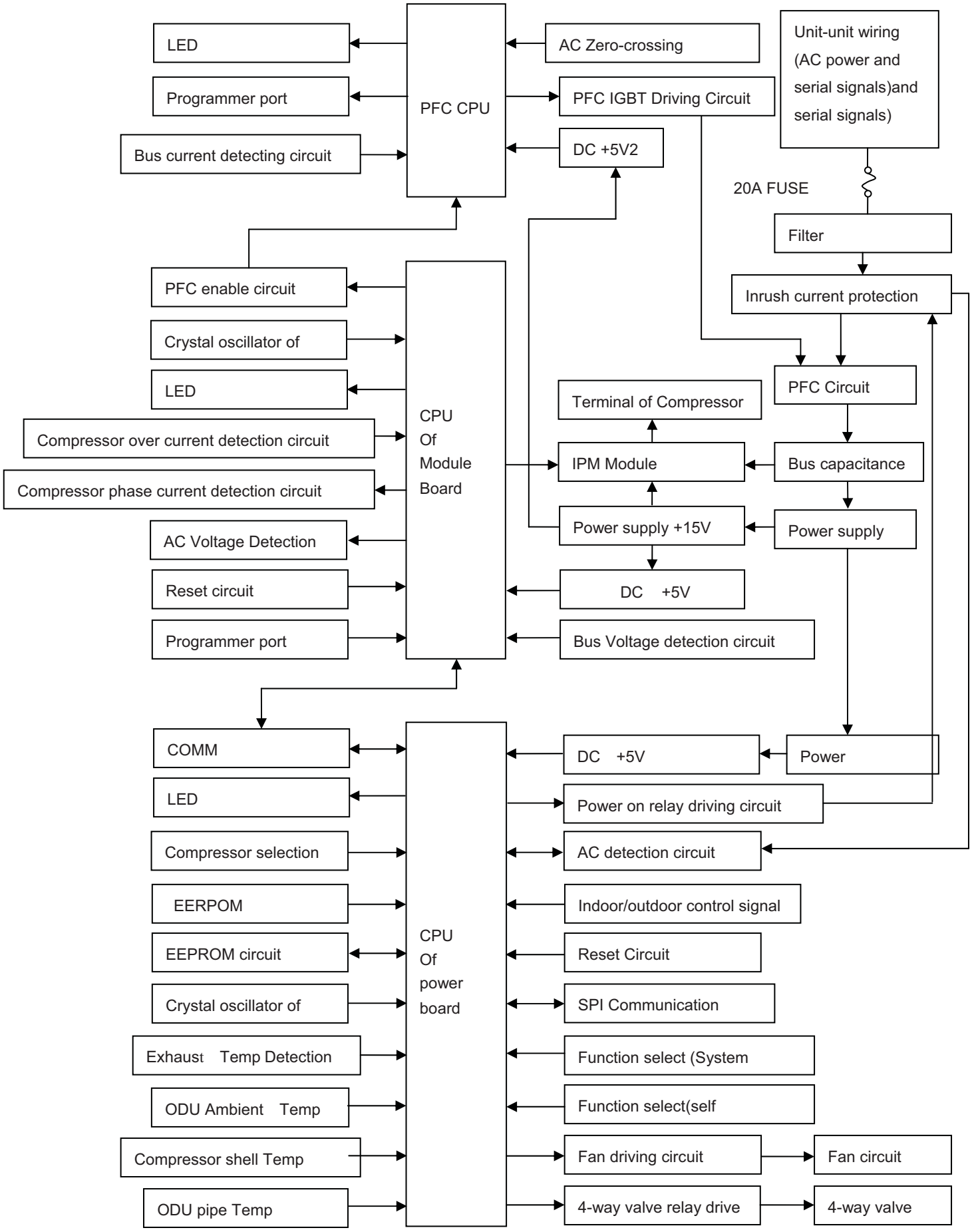
CHAPTER 2.EXPLAMATION OF CIRCUIT AND OPERATTION

[1] BLOCK DIAGRAM

1. INDOOR UNIT



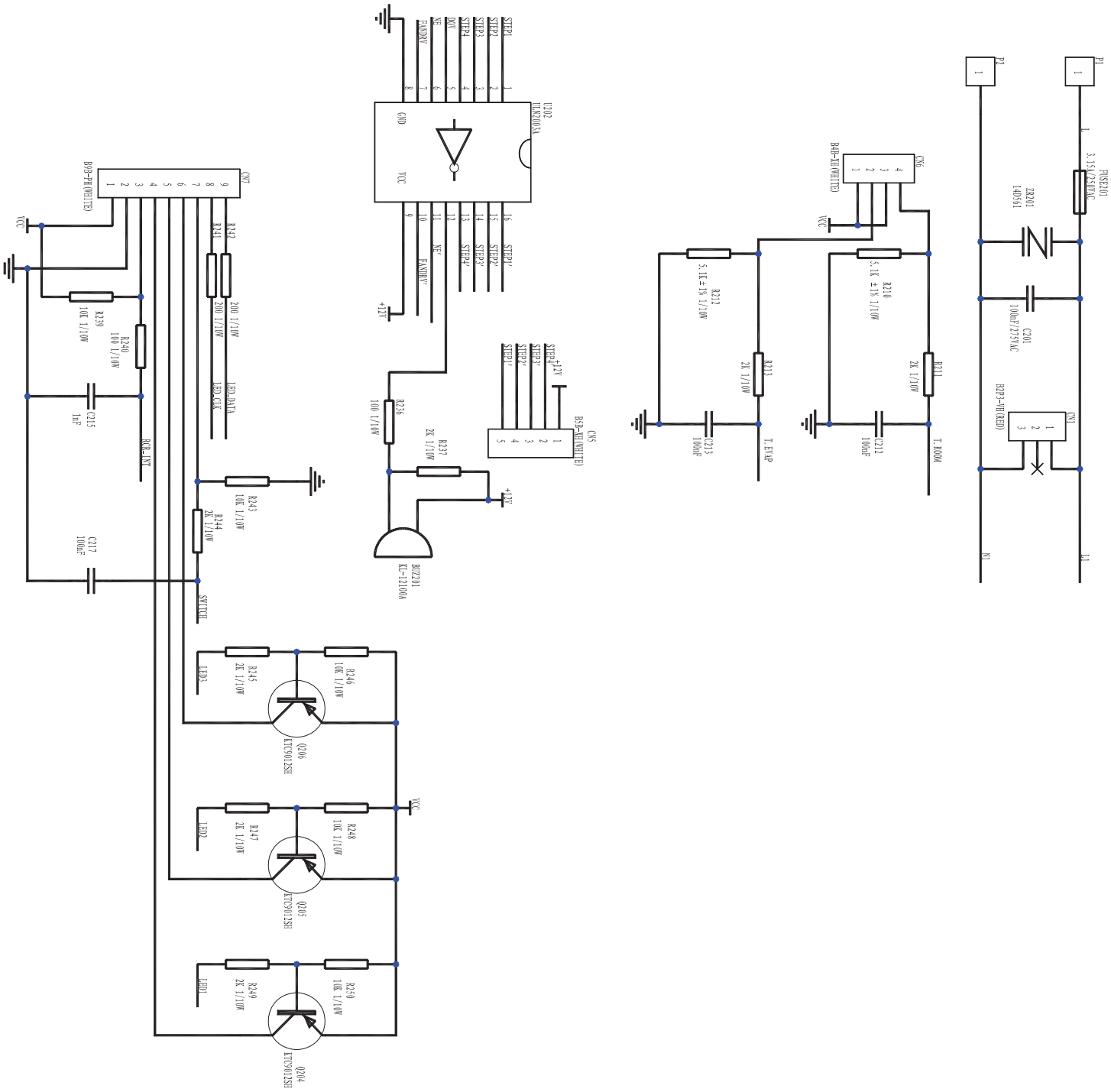
2. OUTDOOR UNIT

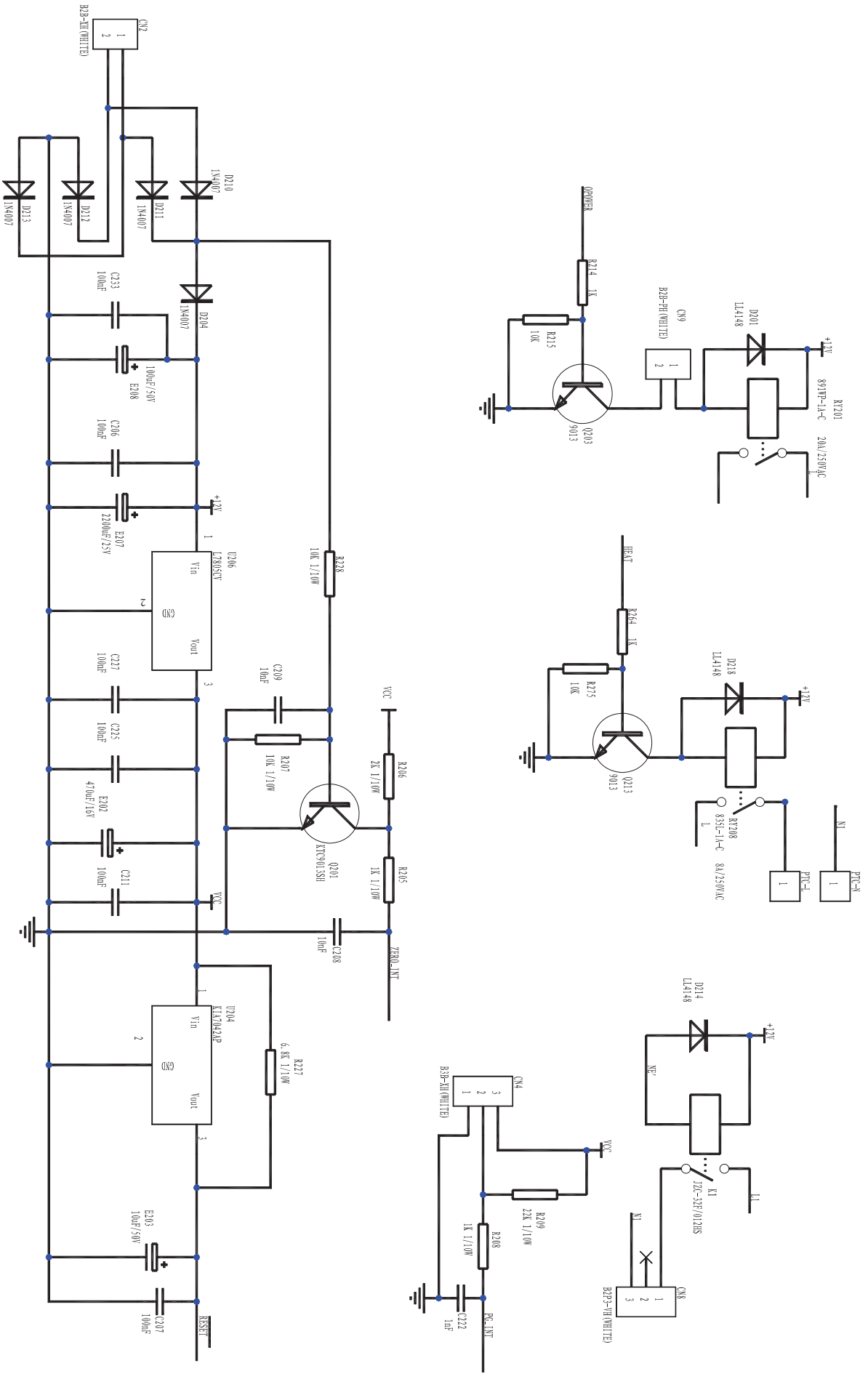


[2] MICROCOMPUTER CONTROL SYSTEM

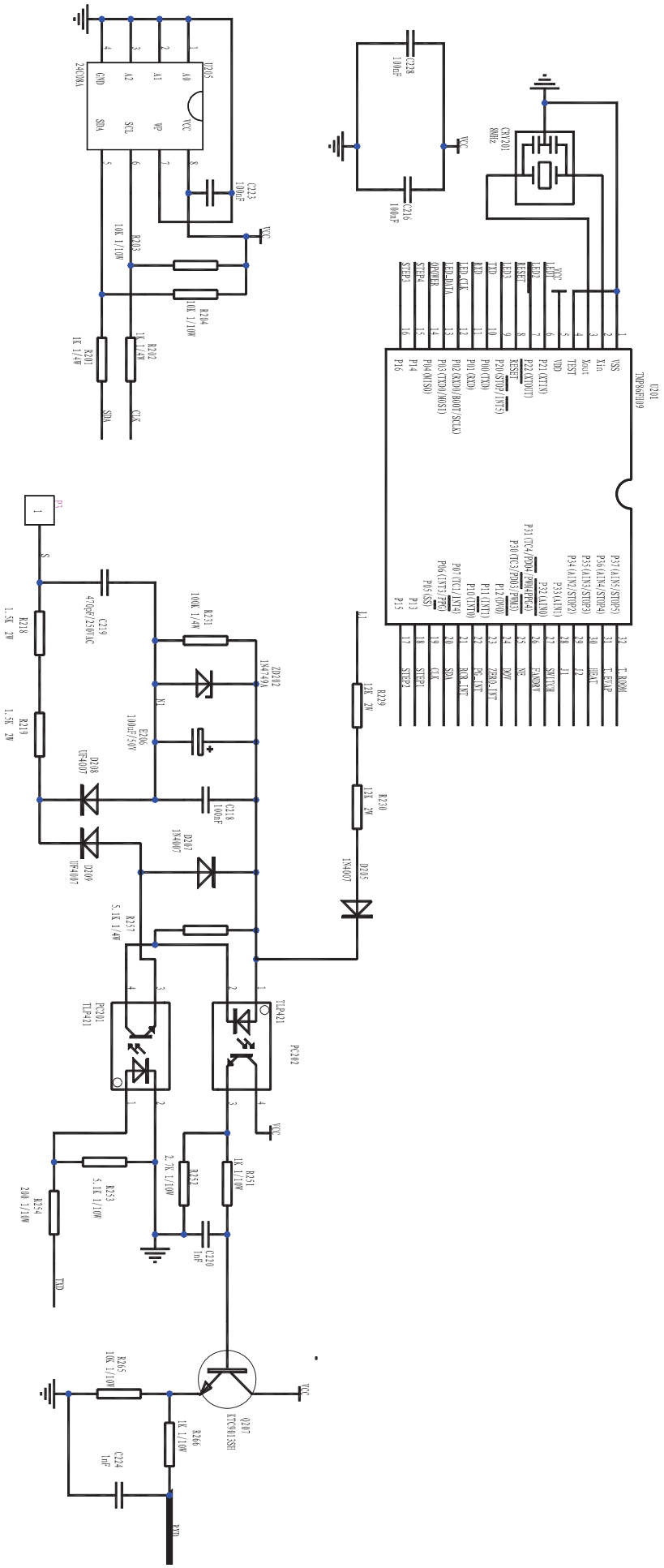
1. INDOOR UNIT

1.1. Electronic control circuit diagram

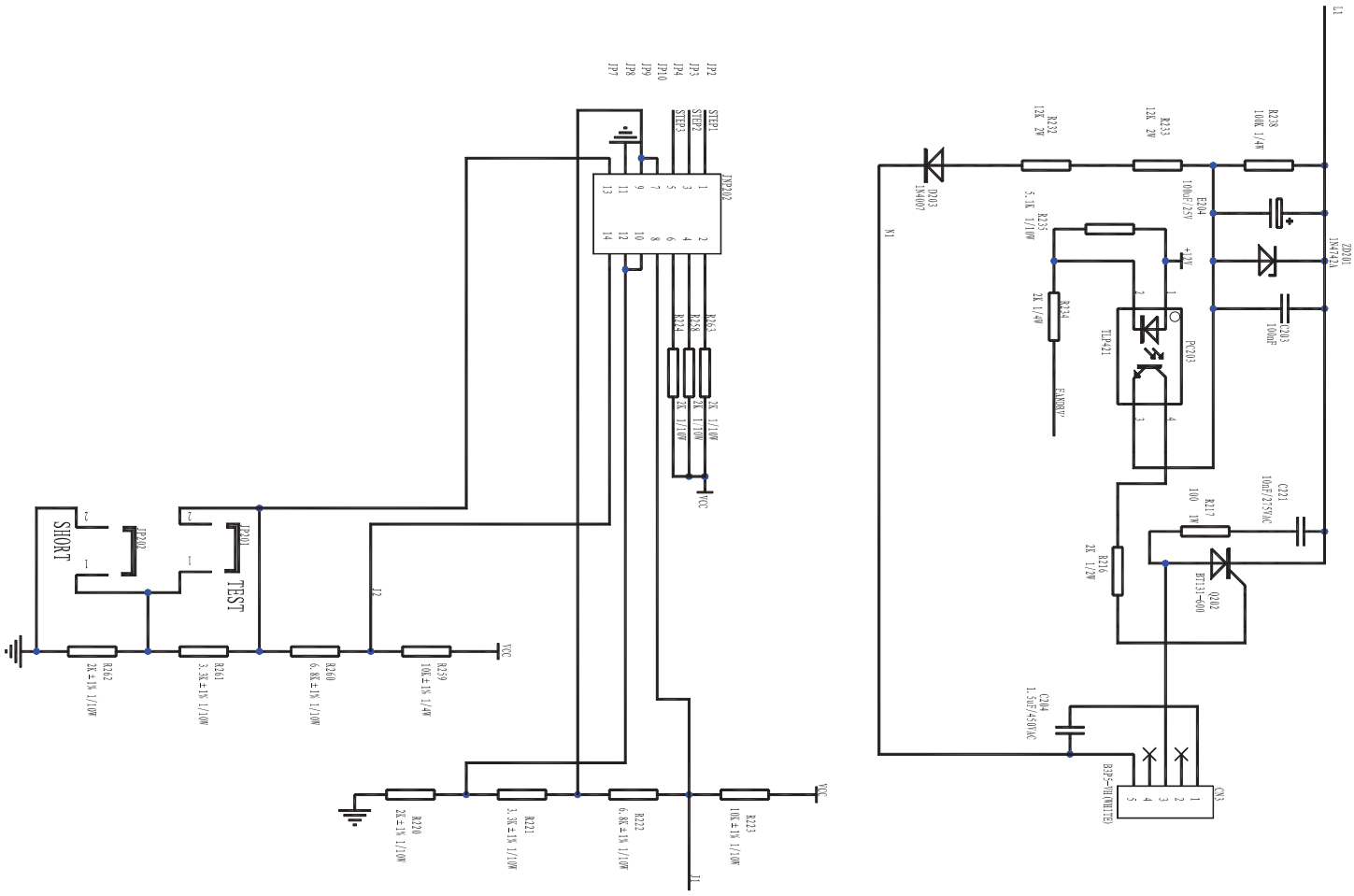




AY-X9PSR/AY-X12PSR



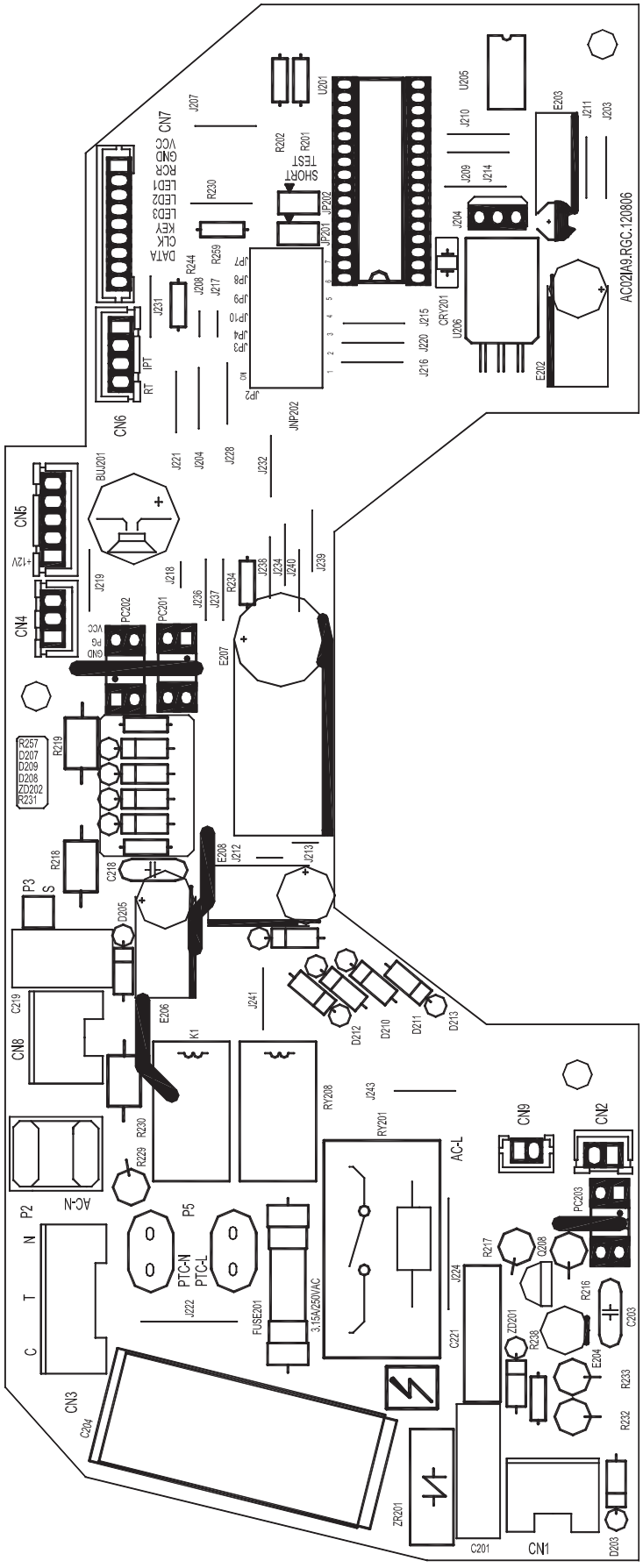
AY-X9PSR/AY-X12PSR



AY-X9PSR/AY-X12PSR

1.2. Printed wiring board

Indoor unit

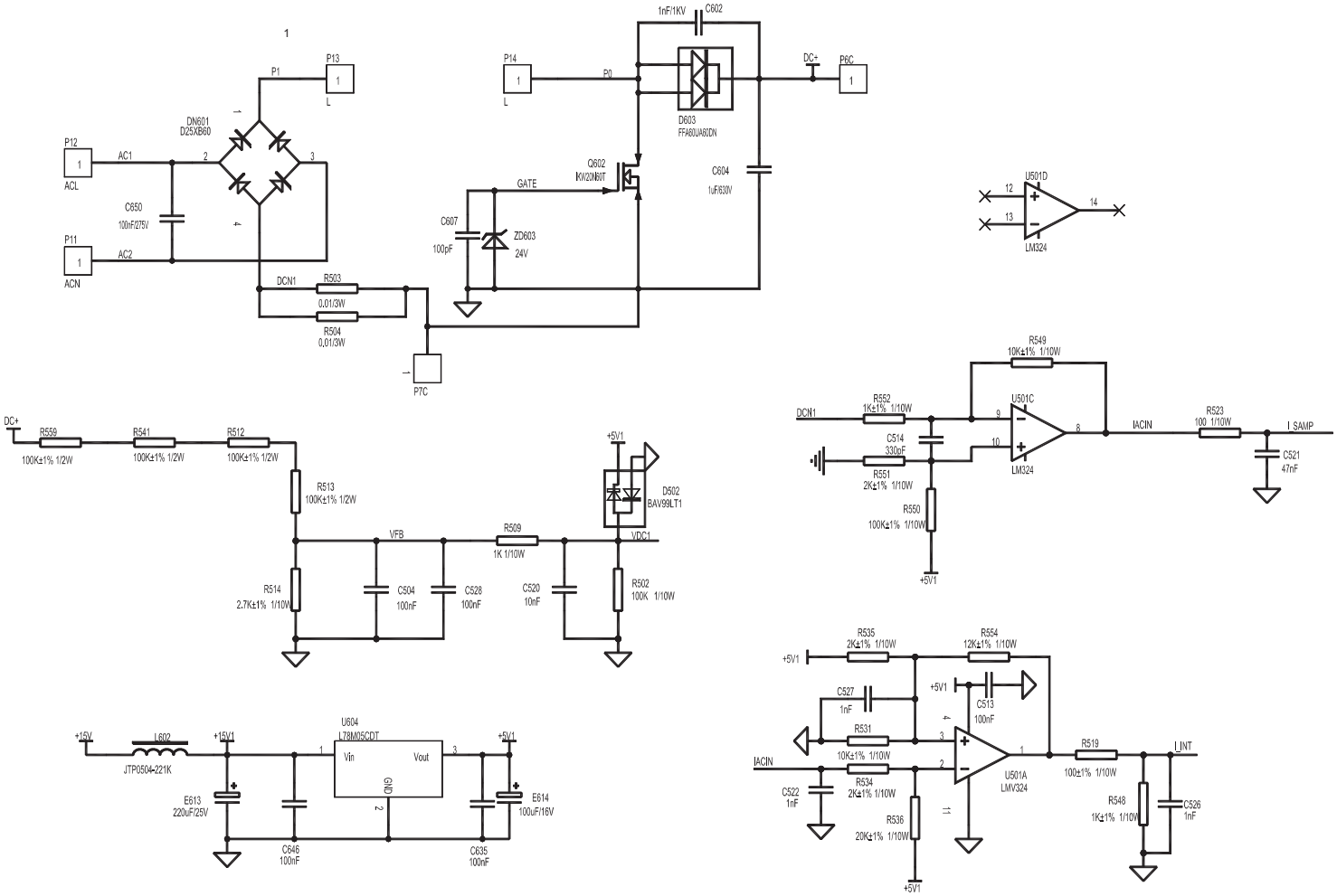


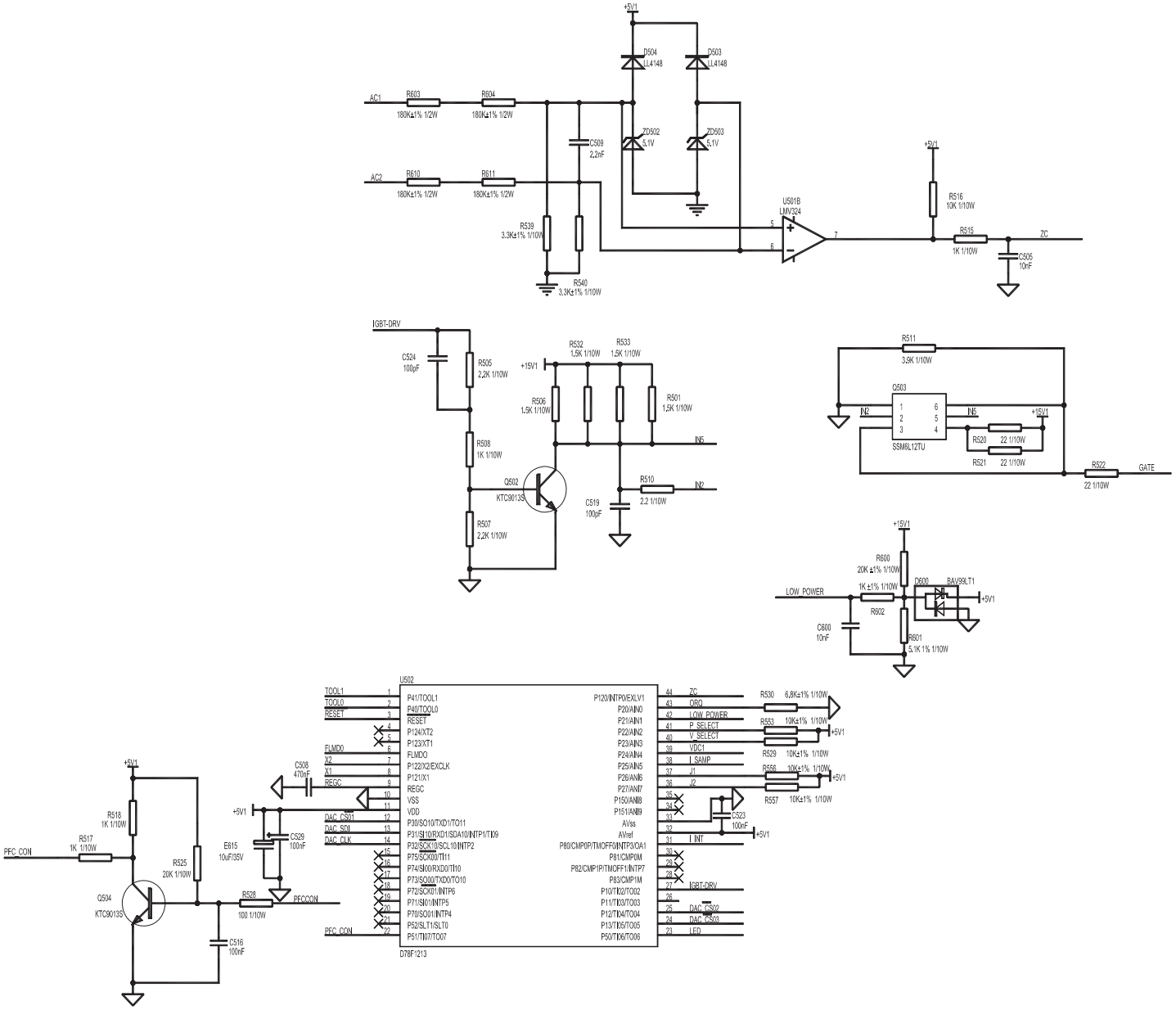
AY-X9PSR/AY-X12PSR

2. Outdoor unit

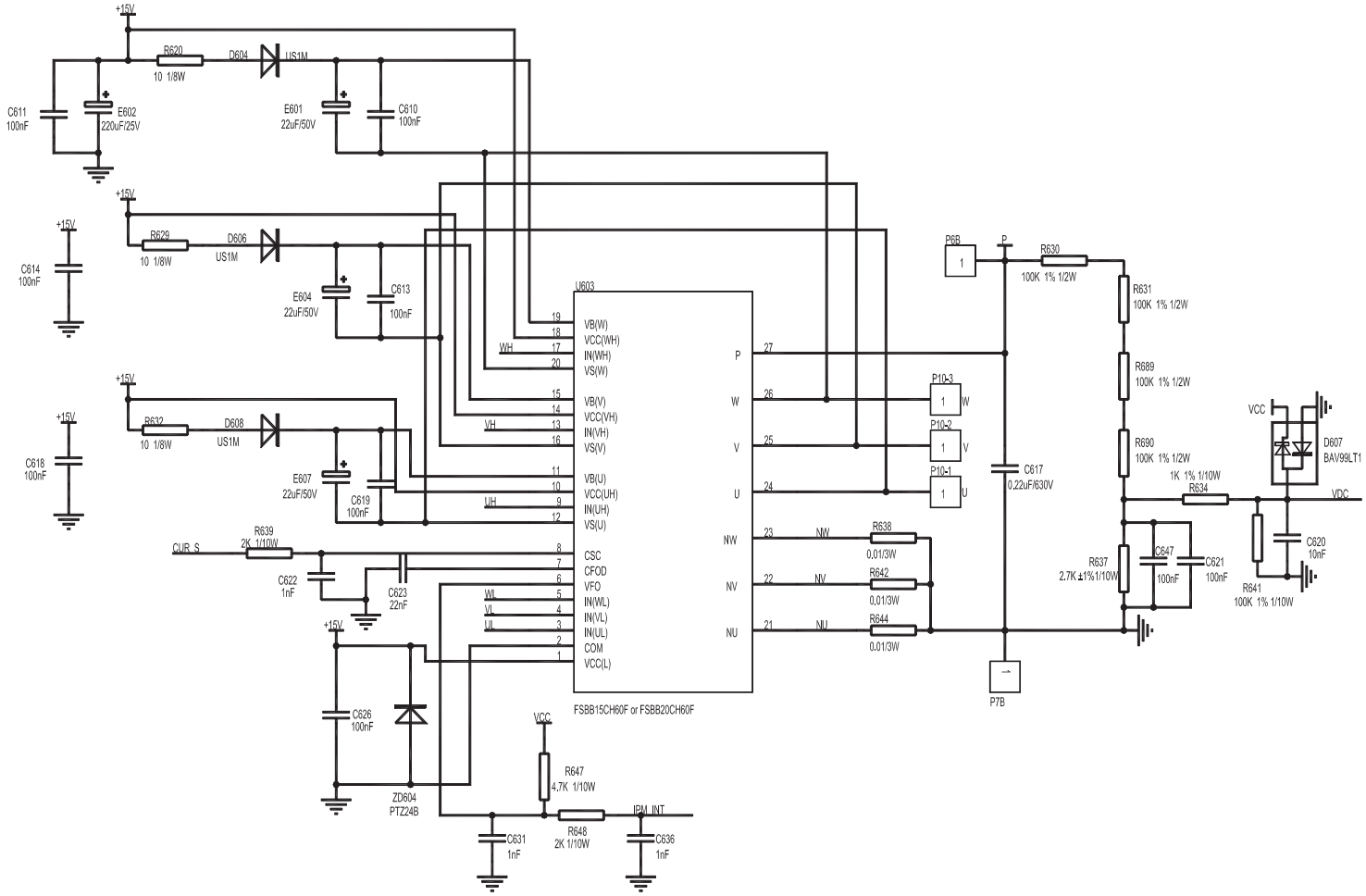
2.1. Electronic control circuit diagram

inverter modul board

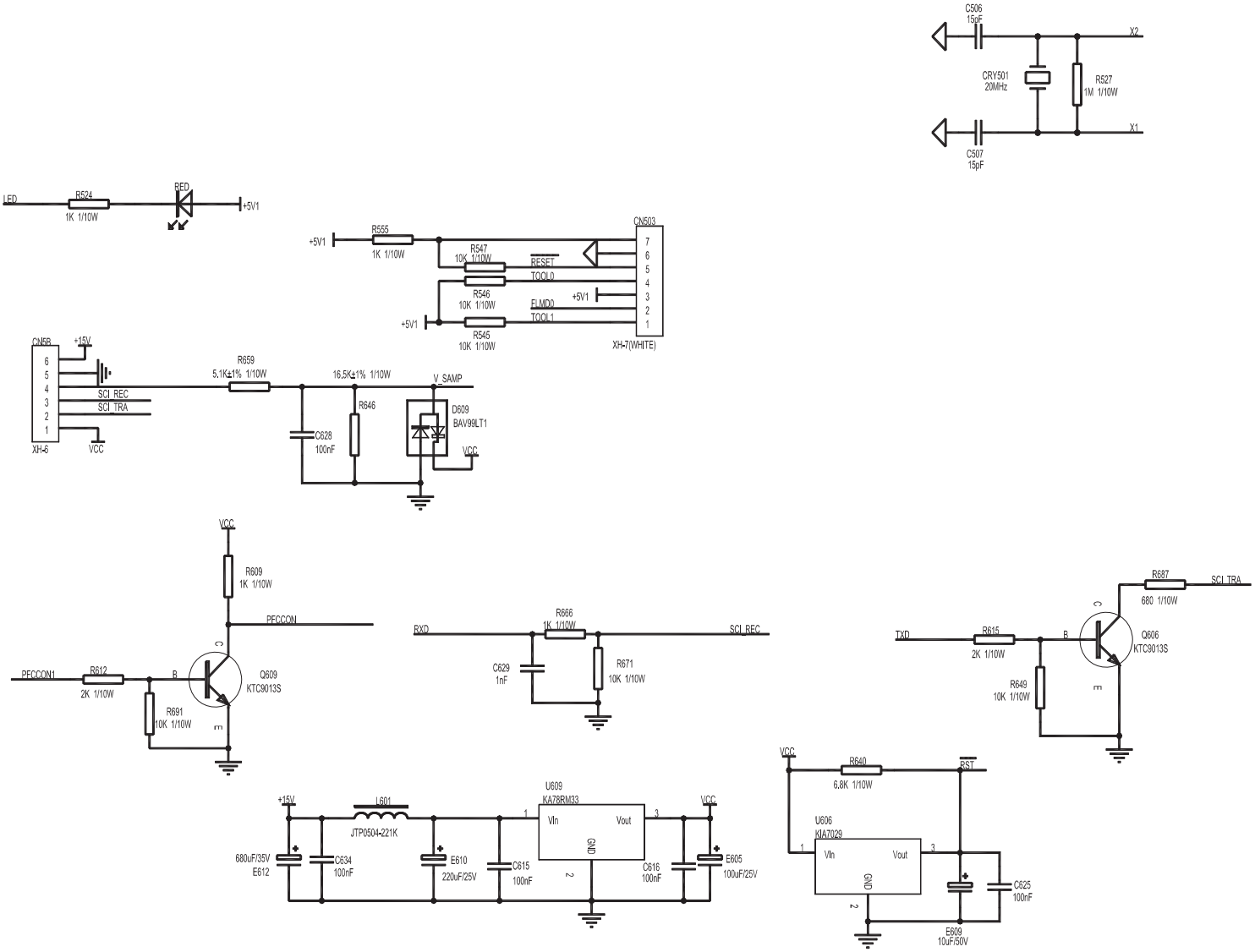




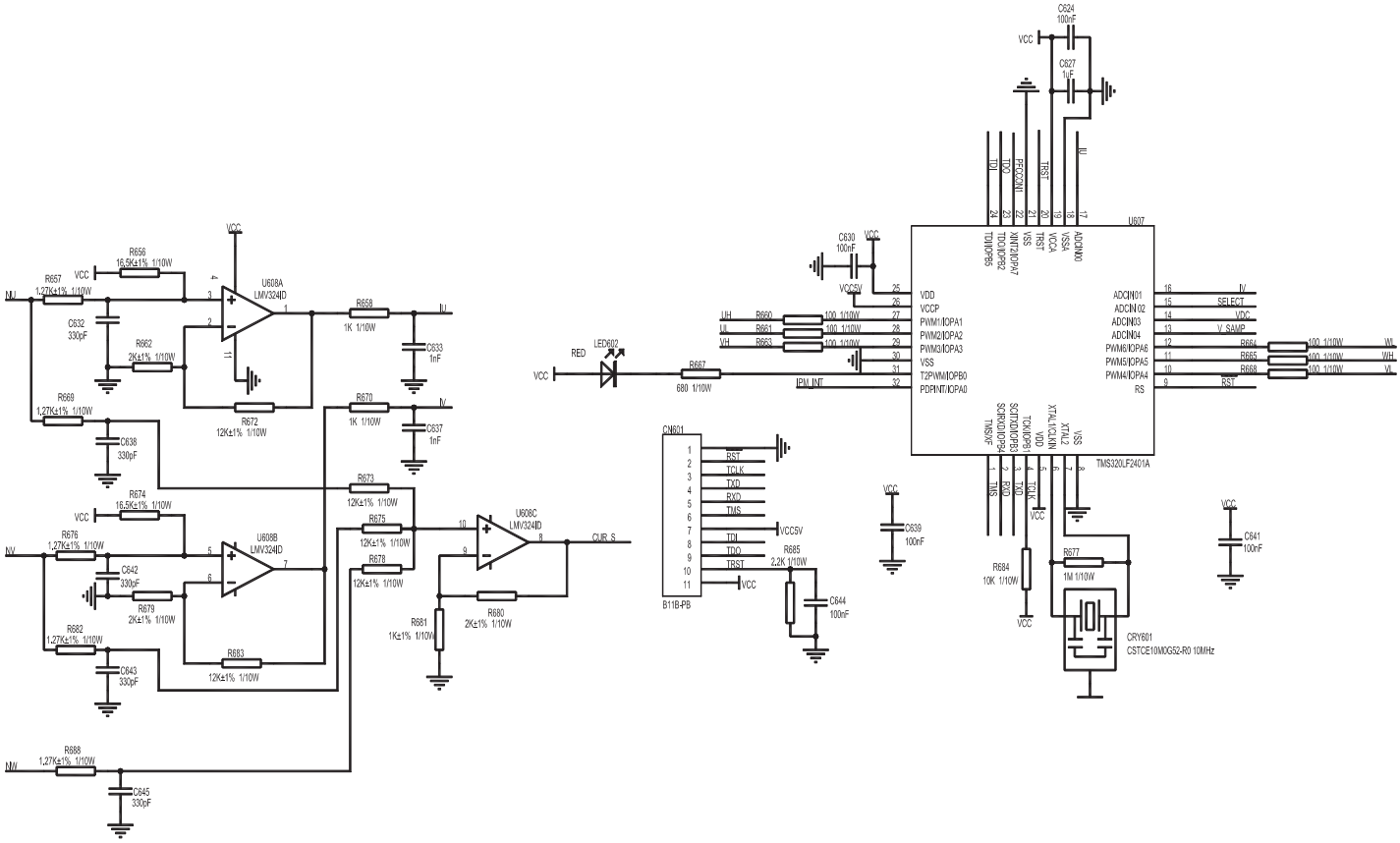
AE-X9PSR/AE-X12PSR



AE-X9PSR/AE-X12PSR

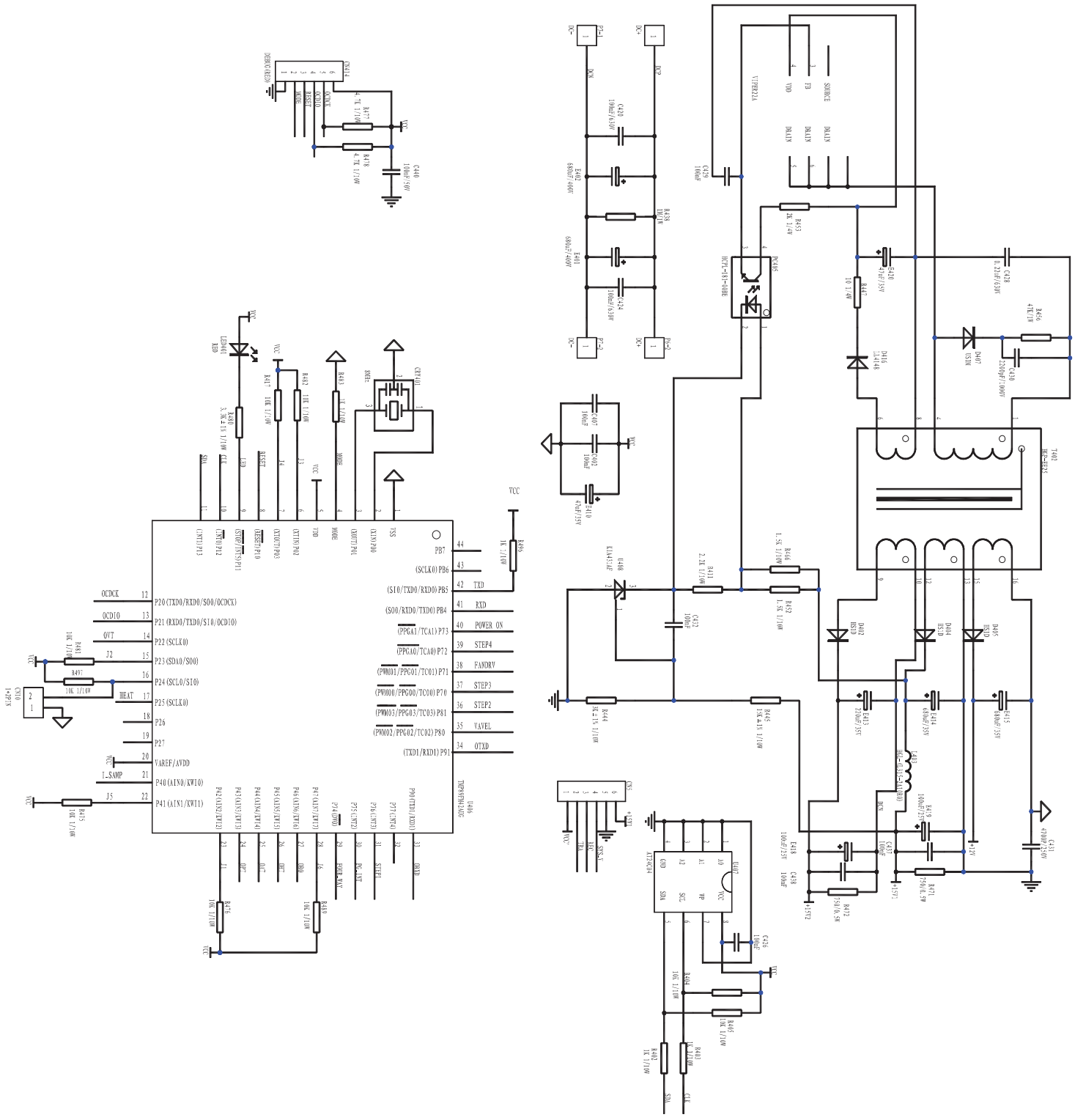


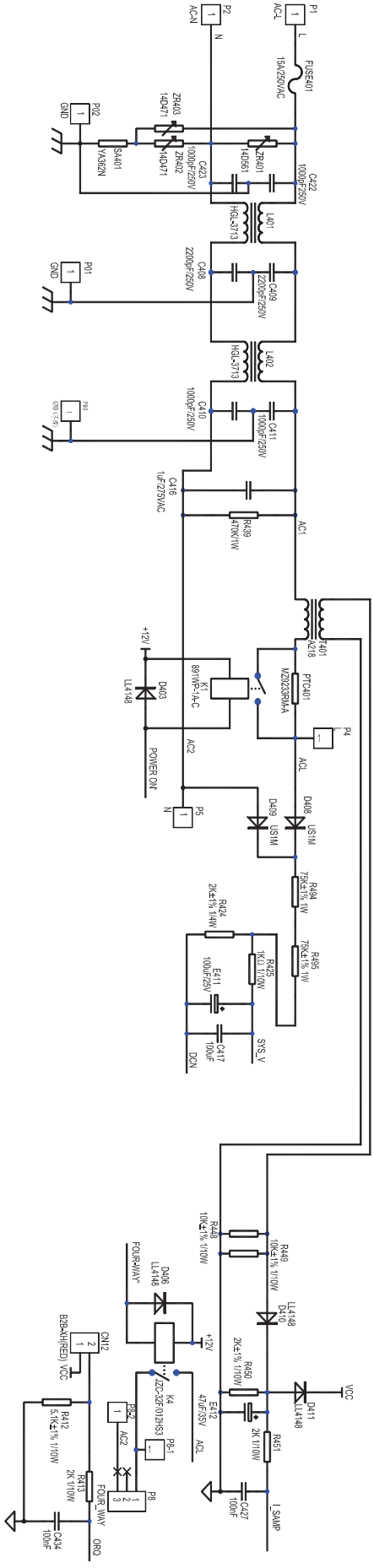
AE-X9PSR/AE-X12PSR



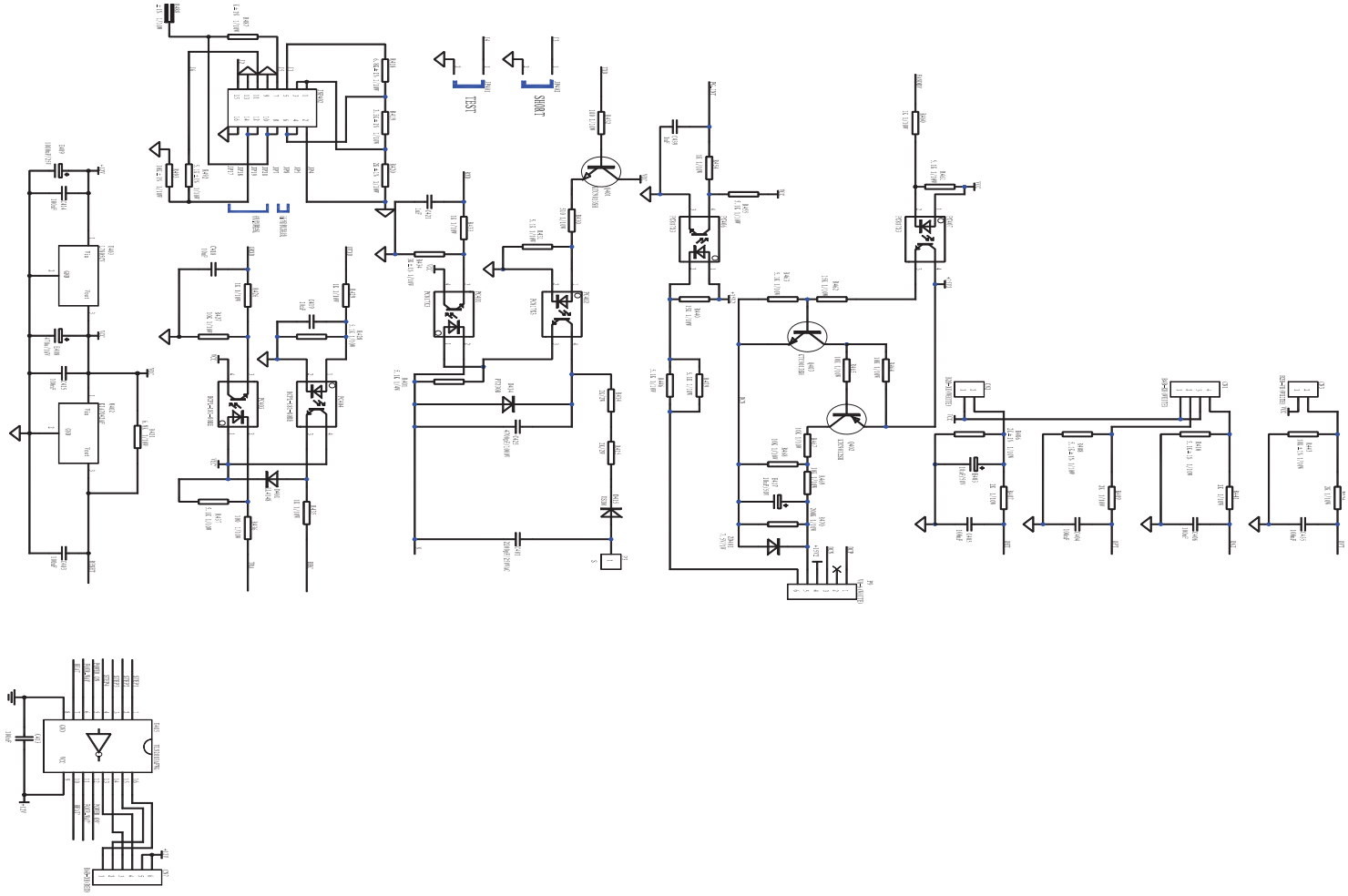
AE-X9PSR/AE-X12PSR

POWER SUPPLY BOARD



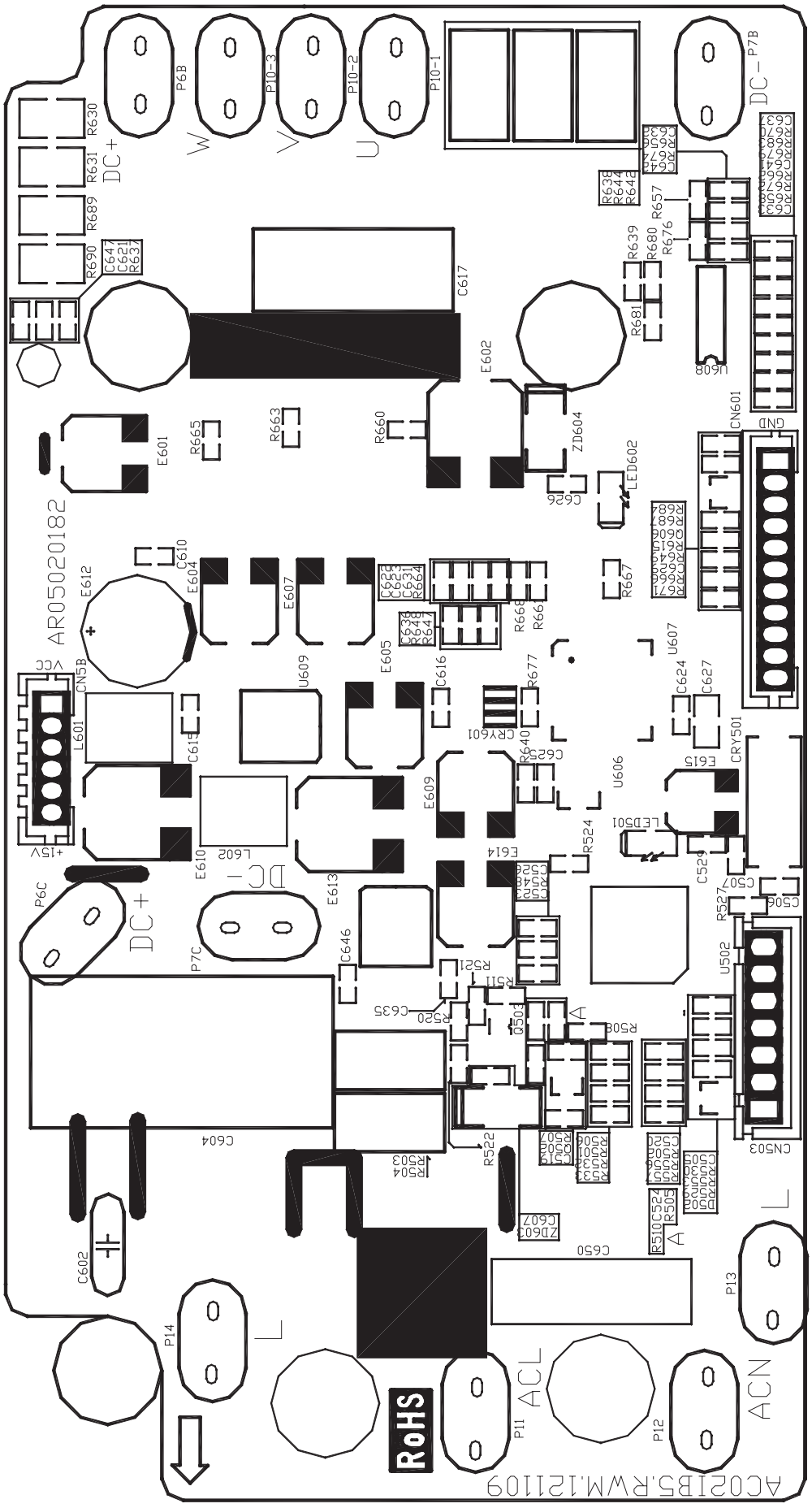


AE-X9PSR/EX-X12PSR



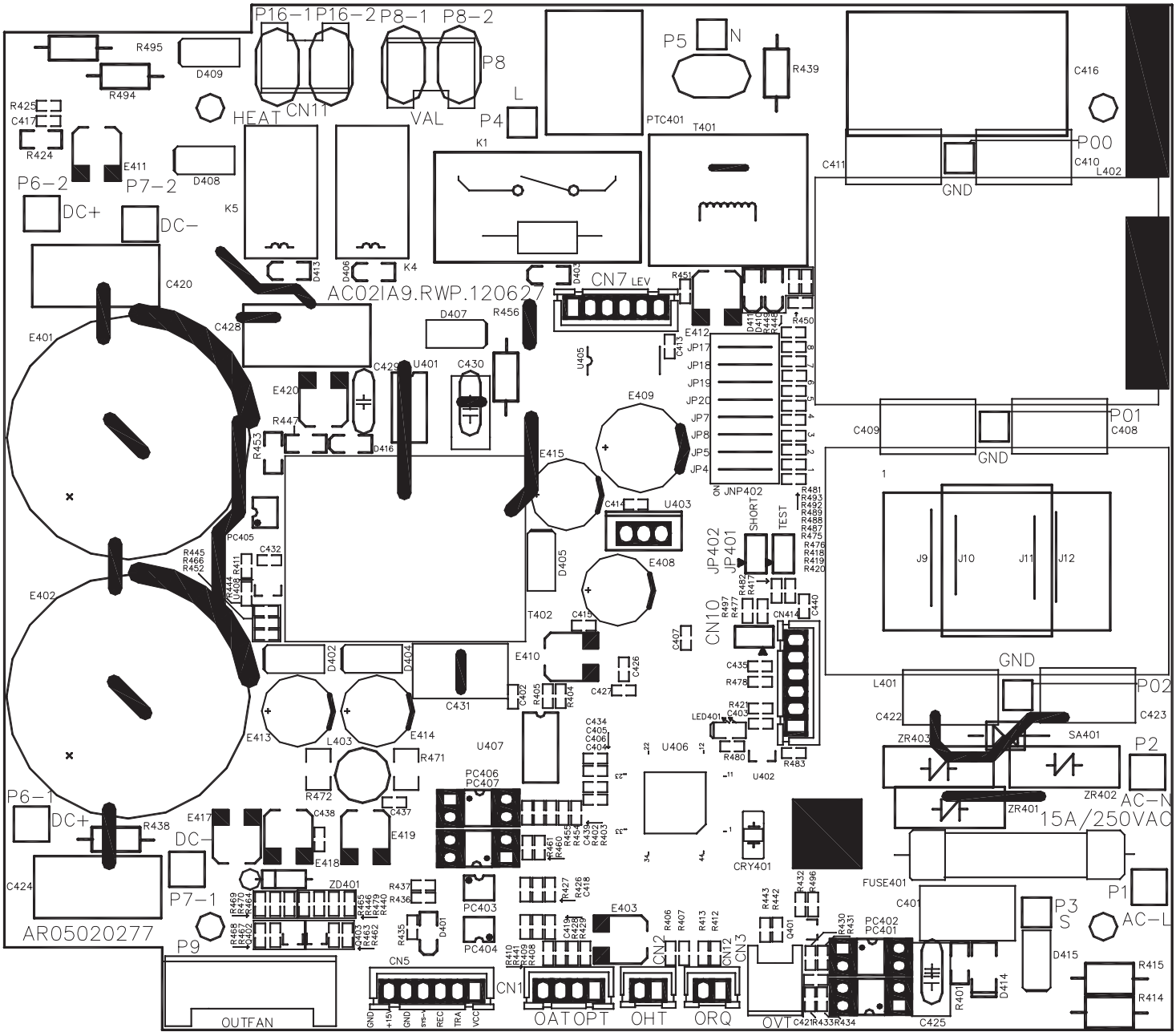
2.2 Printed wiring board

Inverter module board



AE-X9PSR/AE-X12PSR

POWER SUPPLY BOARD



AE-X9PSR/AE-X12PSR

[3] FUNCTION

1. Fuction

1.1. Compressor delay operate

TheOnce the compressor stops operating, it will not restart for 3 minutes to protect the compressor
.
Therefore, if the operating compressor is shut down from the remote control and then turned back on immediately after, the compressor will restart after a preset delay time.

1.2. Four-way valve control in heating model

When the unti operates in heating model, the comprassor start-up after the four-way valve start up for 5 seconds, the four-way valve shut down after the compressor stops for 2 minutes when the unit shut down

1.4.ON timer

The ON timer can be activated by pressing the ON timer button.when the ON timer is activated, the operation start time is adjusted base on fuzzy logic calculations 1hour before the set time so that the room temperature reaches the set temperature at the set time.

1.5. OFF timer

The OFF timer can be activated by pressing the OFF timer button.

- When the OFF timer is set, the operation stops after the set time.
- When the temperature is set during timer setting, the temperature will show in the display for 5 seconds and then return to the timer display.

Timer duration can be set from a minimum half an hour to a maximum of12 hours. Up to 9.5 hours, you can set in half-hour increments, and from10 to 12 hours, in 1hour increments.

1.6. ON/OFF operation

If the air conditioner is off, you can pressing the ON/OFF button to operates cooling or heating mode. Presses the ON/OFF button, when the buzzer sounds 1 short sound then enter cooling operation, 2 short sounds enter heating operation, 1 long sound shut down the unit.

The unit operates in the set mode in the first 10 minutes of ON/OFF operation, in the first 10 minutes, the indoor fan speed operates on high speed, the vane swings, the compressor operates at maximum frequency F4. In cooling operation, the set temperature automatically 1℃ lower than room temp., in heating mode the set temp. automatically 1℃ higher than room temp., then the set temperature set at 23℃ after 10 minutes, the maximum operating frequency is F7.

1.7.Auto restart

Will automatically restart in the same setting whicth were active before the power failure.

1.7.1. Operating mode at auto restart(Cool, Heat, Dry)

- Temperature adjustment (within 2°C range) automatic operation
- Temperature setting
- Fan setting
- Air flow direction
- Power ON/OFF
- Automatic operation mode setting
- Swing louvre

1.7.2. Setting not memorized

- Timer setting

1.7.3. Active auto restart and disabling auto restart function

If the auto resart wasn't actived,you can presse the ON/OFF switch and then supply the power and keep 10 seconds(the buzze sound 3 sounds) to actives it.

Contrary, if the auto restart has actived, you can press the ON/OFF switch and then supply the power and keep until 4beeps sound to disable it.

1.8. FULL POWER Operation

The airconditioner works at the maximum power to make the room cool or warm rapidly

- The remote control will display " " button
- The temperature display will go off.
- The yellow FULL POWER lamp " " on.

TO CANCEL

Press the FULL POWER button again.
The yellow FULL POWER lamp " " on the unit will turn off

NOTE

- The airconditioner will operate at "Extra HIGH" fan speed for 5 minUtes, and then shift to "HIGH" fan speed.
- You can not set the temperature or fan speed during the FULL POWER operation.

1.9. compressor discharge overheat prevevtion control

When the compressor discharge temperature≥TP2(95℃), forbid the frequency raise until the discharge temperature is bellow than TP2 decrease 2℃.

When the discharge temperature≥TP3(100℃), drop the operating frequency. If discharge temperature is over 105℃, then shut-down the compressor, outdoor fan motor stop after 15 seconds, when the discharge temperature＜TP2(95℃) and the compressor is stoped for 3 minutes, the unit operates again.

1.10. Voltage prevention

When the voltage AC≤ 158V, the uint stops and displays the code P1 until the voltage AC≥162V , when the voltage AC≥265V and keeps 30 minutes, the unit stops and displays code P1 until the voltage AC≤ 260V.

1.11. Over current prevention

- when the outdoor current≥I_{drop} frequency,the controller drops1Hz/second until the minimum operation frequency.

- when the unit enter drop frequency prevention opreates, if $I_{drop} \geq I_{outdoor} \geq I_{normal}$, the controller limit the operation frequency rise until $I_{outdoor} < I_{normal}$.

- When the outdoor current $\geq I_{max}$, the compressor stops and outdoor motor stops after 15 seconds

1.12. Compressor drive prevention

During the compressor start up or operation, if the signal of the compressor can't be checked or check the load is exceptonal or driver fail then shut down the outdoor unit and displays the fail code.

1.13. Indoor unit evaporator freeze prevention

When the indoor evaporator temperature IPT≤4℃ and keeps 1 minutes, the uint enter the evaporator freeze prevention. If the indoor evaporate temperature IPT≤-1℃and remains 5 minutes during cooling or dry operation, the compressor stops in order to prevent the freezer and displays code P5.

When the indoor unit evaporator temperature IPT≥6℃, the compressor restarts and resumes normal operation.

1.14. Outdoor unit overheat prevention

During cooling operation, if the temperature of the outdoor unit heat-exchanger OPT exceeds the limit frequency rise temperature TOP2, the contoller limit the operation frequency rise unti the OPT＜TOP2.

If if the temperature of the outdoor unit hea-texchanger OPT reach or exceeds stops unit temperature TOP4, the compressor stop operating,until OPT≤TOP1(prevention cancel temperature), the unit restart and opreates at normal.

1.15. Indoor unit overheat prevention control

During heating operation, if the temperature of the indoor unit heat-exchanger IPT exceeds the limit frequency rise temperature TIP2, the contoller limits the operation frequency rise unti the IPT＜TIP2.

If the temperature of the outdoor unit heat-exchanger IPT reaches or exceeds stops unit temperature TIP4, the compressor stops operating and diplayes code P7,until IPT≤TIP1(prevention cancel temperature), the unit restart and opreates at normal.

1.16. IPM pretector

If the IPM checked the temperature itself or current is higher than prevent temperature or current, the contrller shuts down the outdoor unit and displays code P0, when the IPM temperature or current drops to lower than prevention temperature, the outdoor unit restarts and operates at normal.

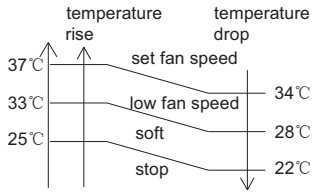
1.17. Startup control

When the air conditioner starts in the cooling or heating mode, if the room temperature is 3.5°C higher than the set temperature, the unit operates with the operating frequency at maximum. Then, when the set temperature is reached, the unit operates at the operating frequency determined by fuzzy logic calculation, then enters the normal control mode after a while.

1.18. Cold air prevention control

When the air conditioner starts up in heating mode, the indoor unit fanwill not operate until the temperature of the indoor unit heat excharge reaches about 33°C in order to prevent cold air from blowing into the room.

Also, the indoor unit fan operates at low speed until the temperature ofthe indoor unit heat exchanger reaches about 37°C so that people inthe room will not feel chilly air flow.



1.19. Auto restart

When power failure occurs, after power is recovered, the unit will automatically restart in the same setting which auto restart function were active before the power failure, except for timer settings.

If a power failure ocurse while the timer is set, the timer setting will be cancelled and willl not be retrived even after the power is restored.

1.20. Defrosting

Defrosting is controlled by the microprocessor.

1.20.1. conditions of defrosting

The defrost operation starts when the one of the following conditions is satisfied, the unit will come into defrosting. When the defrost operation starts, if the indoor excharge temperature less than 34℃, the indoor unit fan stops.

- **a.** utdoor heat exchanger Temperature (OPT) is continuously up to or less than 3℃ while the unit runs for more than 40 minutes, and OPT is keep under -6℃ for more than 3 minutes.
- **b.** Outdoor heat exchanger Temperature (OPT) is continuously uo to or less than 3℃ meanwhile the unit runs for more than 80 minutes, and OPT is keep under -4℃ for more than 3 minutes.
- **c.** Outdoor heat exchanger Temperature (OPT) is continuously up to or less than 3℃ while the unit runs for more than 120 minutes, and OPT is keep below -2℃ for more than 3 minutes.
- **d.** Once in the heating mode, if the outdoor heat excharge temperature(OPT) keep lower than 0℃ and outdoor temperature higher than 3℃, also the compressor operates for more than 20 minutes and the outdoor heat exchanger Temperature (OPT) reaches -6℃ or less and keeps 3 minutes, enter the first defrost.

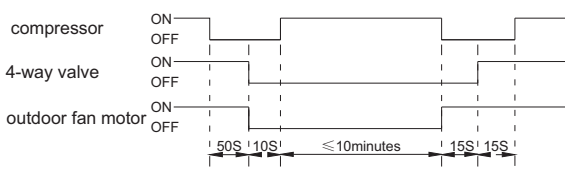
The defrost operation stops when the outdoor unit heat-exchanger temperature rises to about 15°C or higher or the defrosting time exceeds 10 minutes.

1.20.2. Compressor operation frequecy

Before the air conditioner come into defrosting, compressor running frequen- cy drop down to a lower frequency firstly, then the compressor shuts down.

In defrosting, the max. frequency of compressor is F9, in this period all protection functions are avaliable.

1.20.3 The part operation order.



1.21. Information about auto mode.

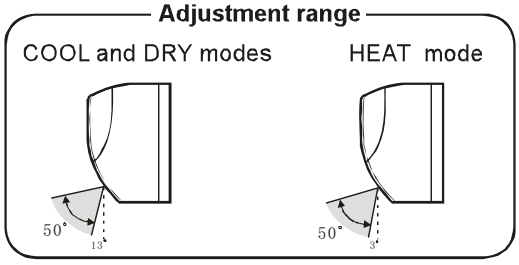
In the AUTO mode, the temperature setting and mode are automatically selected according to the room temperature when the unit is turned on.

Model	Initial Room Temerature	Initial Set Temperature
COOLING	RT≥26℃	23℃
DRY	26℃＞RT≥20℃	RT-2
HEATING	RT＜20℃	23℃
FAN	RT＜20℃	-

- In the “AUTO”model, when the controller receives the up or down singnals of temperature from remote control, the set temperature can be adjusted by 1℃ upper or lower. The maximum you can adjust by 2℃ upper or lower.
- If the “AUTO” mode operates in DRY , the set temperature and the fan speed can’t changed.

1.22. Airflow control

- Press the SWING button, the vetical air flow louver will swing.
- Press the SWING button again to stop at the desired position.



1.23. Difference relating to set temperature

	Auto mode			Manual mode		
	Cooling	Heating	Drying	Cooling	Heating	Drying
Temperature setting method	Automatic temperature setting based on outside air temperature. Can be changed within ±2°C using remote con-trol.			Can be changed between 18 and 32°C using remote control.	Can be changed between 18 and 32°C using remote control.	Automatic setting. Can be changed within±2°C.

1.24. Drying operation control

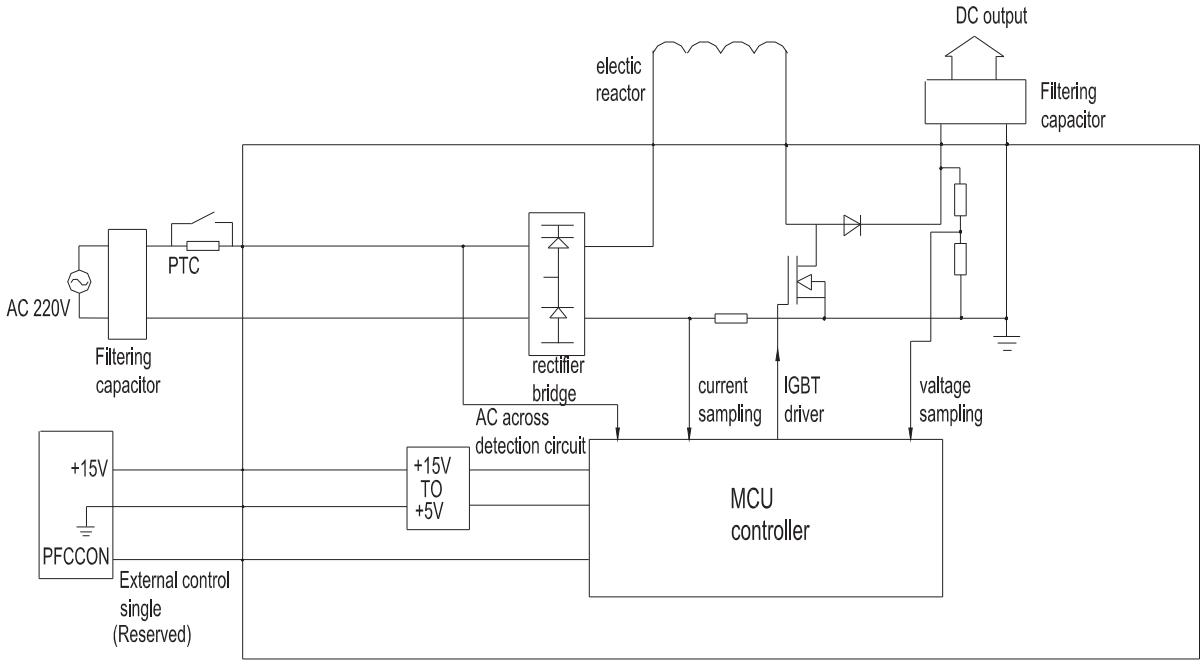
When the unit operates in drying mode, the set temperature is set and keep at room temperature decrease 2°C , and you can not adjusted it.

2. Outline of PWM (Pulse Width Modulation) circuit

2.1. Power Factor Correction(PFC)

The PFC circuit varies the compressor drive voltage and controls the rotation speed of the compressor.

The IGBT shown in the block diagram charges the energy (electromotive force) generated by the reactor to the electrolytic capacitor for the inverter by turning ON and OFF.



When the IGBT is ON, an electric current flows to the IGBT via the reactor.

When the IGBT turns OFF, the energy stored while the IGBT was ON is charged to capacitor.

As such, by varying the ON/OFF duty of the IGBT, the output voltage is varied.

This circuit brings the operating current waves form closer to the waveform of commercial power supply voltage to maintain a high power factor.

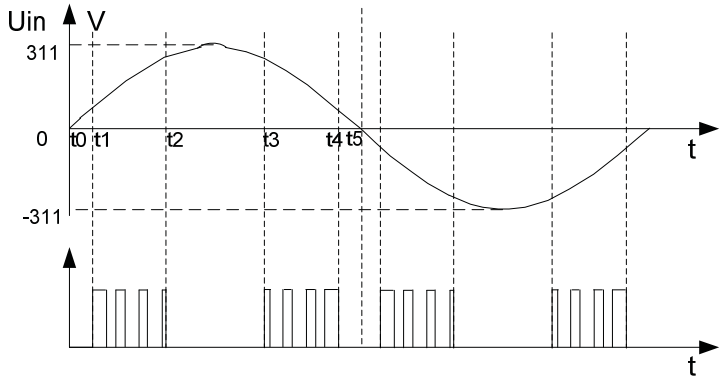
Because of the capacitor input, when the PFC circuit is OFF, the phase of the current waveform deviates from the voltage waveform.

The IGBT turns ON after the time length determined by the zero-cross point to supply a current to the IGBT via the reactor.

This brings the current waveform closer to the voltage wave form in phase.

As described above, the ON/OFF operation of the IGBT controls maintain a high power factor by keeping the current phase closer to that of the supply voltage.

2.2 Detailed explanation of PFC drive circuit sequence



t0~t1: IGBT Off, to detect the voltage Zero-crossing;

t1~t2: IGBT PWM (20KHz), to improve current waveform closer to voltage waveform;

t2~t3: IGBT Off;

t3~t4: IGBT PWM (20KHz), to improve current waveform closer to voltage waveform;

t4~t5: IGBT Off, to detect the voltage Zero-crossing;

The detected clock waveform is used to judge the power source frequency (50Hz/60Hz).

3. Explanation of IPM drive circuit

The IPM for compressor drive is made by Fairchild.

The power supply for the IPM drive, the shunt resistance for over current detection, etc., are provided outside the IPM (control PCB).

3.1. IPM drive power supply circuit

The power supply for the upper-phase IGBT (HU, HV, HW) drive employs a bootstrap system, and provides power to the upper-phase IC.

The 15-V power supply for the lower-phase IC is provided by the control printed circuit board (PCB).

3.1.1 Brief explanation of bootstrap system (single power drive system)

To supply power to the upper-phase IC, the microcomputer (IC1) turns ON the lower-phase IGBT (LU, LV, LW).

This results in a charging current that flows to the electrolytic capacitor of each upper-phase IC input and charges the bootstrap capacitor with a 15V current

The power supply for the subsequent stages is charged while the lower-phase IGBT is ON in ordinary compressor drive control.

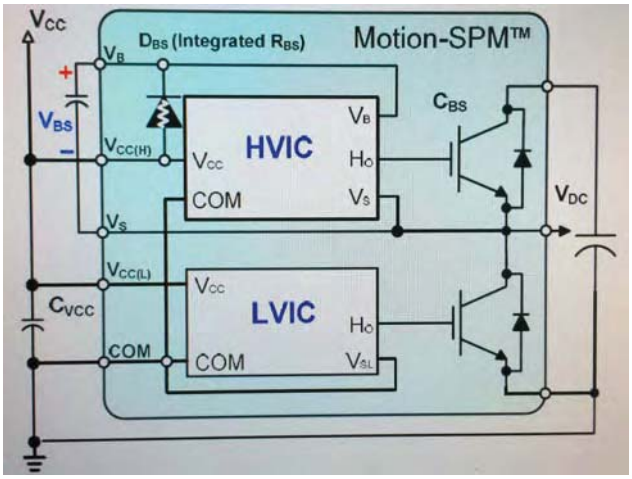
-Bootstrap Circuit Design

Operation of Bootstrap Circuit

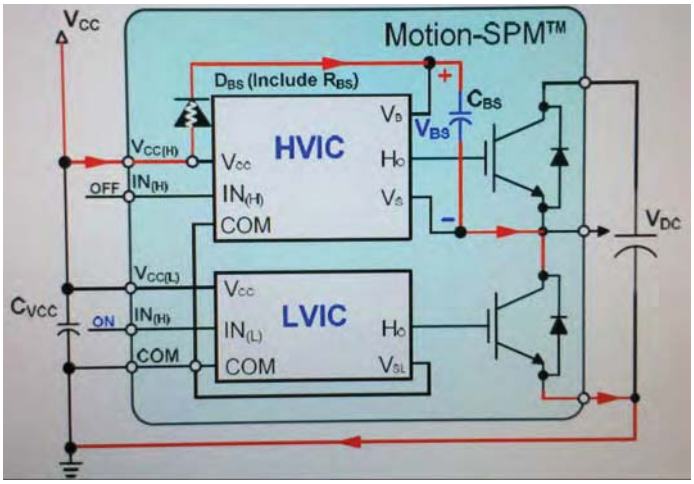
The V_{BS} voltage difference between $V_{B(U,V,W)}$ and $V_{S(U,V,W)}$, provides the supply to the HVIC within the µMini-DIP SPM package family in Motion-SPM products. This supply must be in the range of 13.0V~18.5V to ensure that the HVIC can fully drive the high-side IGBT. The µMini-DIP SPM package includes an under-voltage lockout protection for the V_{BS} to ensure that the HVIC does not drive the high-side IGBT, if the V_{BS} voltage drops below a specific voltage(refer to the datasheet).This function prevents the IGBT from operating in a high-dissipation mode.

The V_{BS} Floating supply can be generated a number of ways, including the bootstrap method described here (refer to Figure 34).This method has the

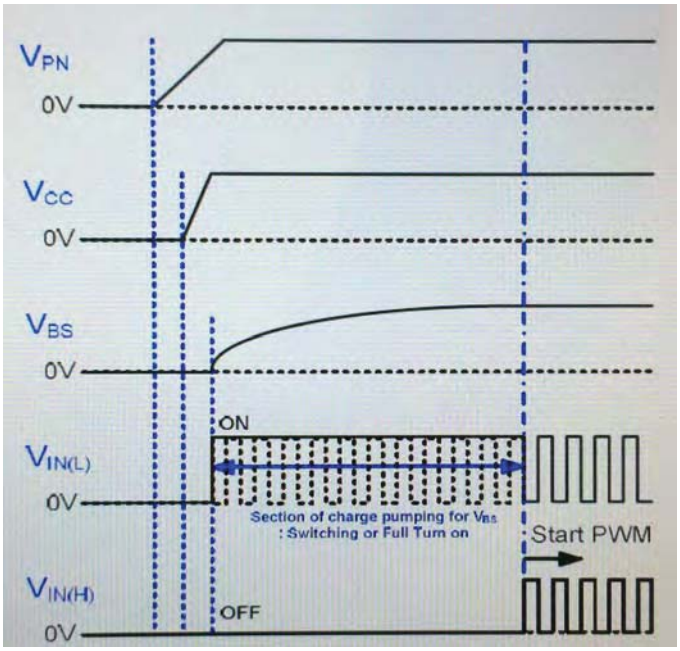
advantage of being simple and inexpensive; however, the duty cycle and on-time are limited by the need to refresh the charge in the bootstrap capacitor. The bootstrap supply is formed by a combination of and bootstrap diode, resistor, and capacitor as shown in Figure35 and Figure36. The current flow path of the bootstrap circuit is show in Figure 35. When V_s is pulled down to ground (either through the low-side or the load), the bootstrap capacitor C_{BS}) is charged through the bootstrap diode (D_{BS}) and the resistor (R_{BS}) from the V_{CC} supply.



(Figure 34)



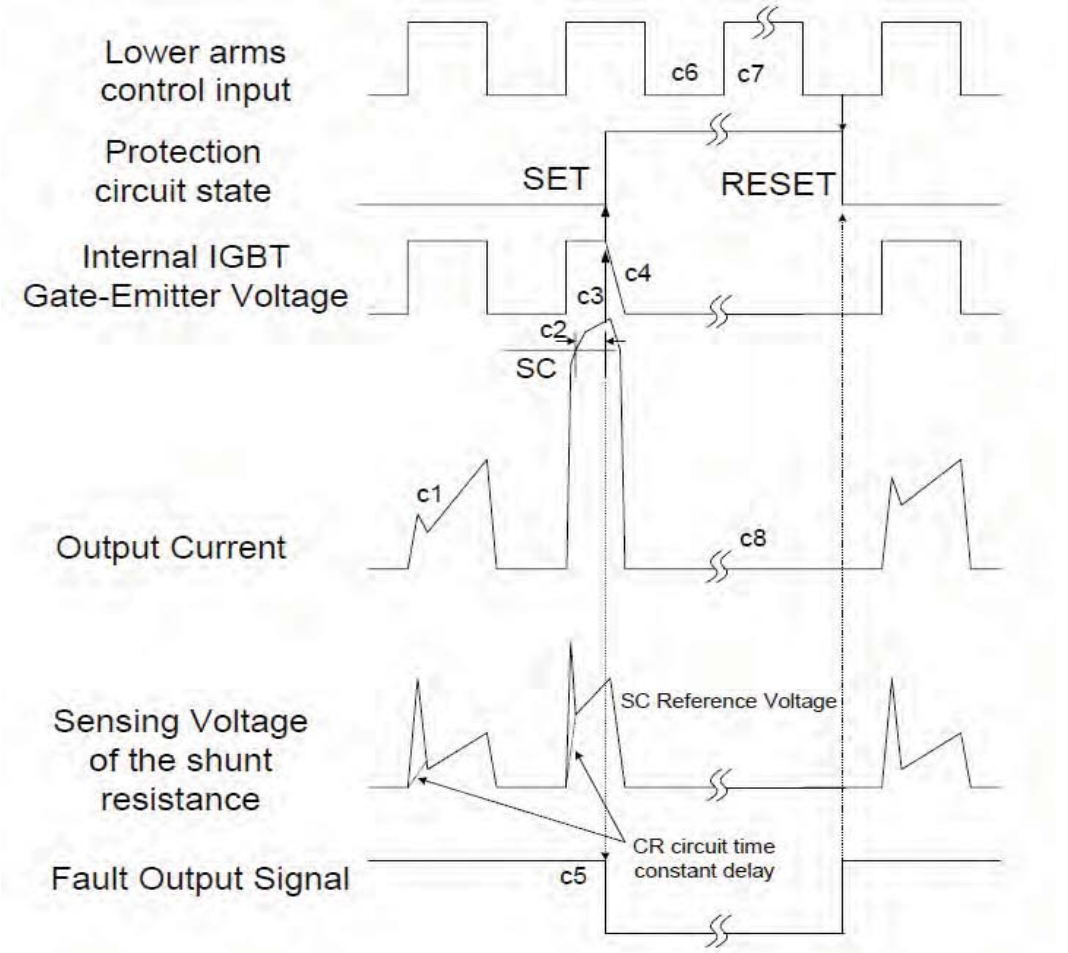
(Figure 35)

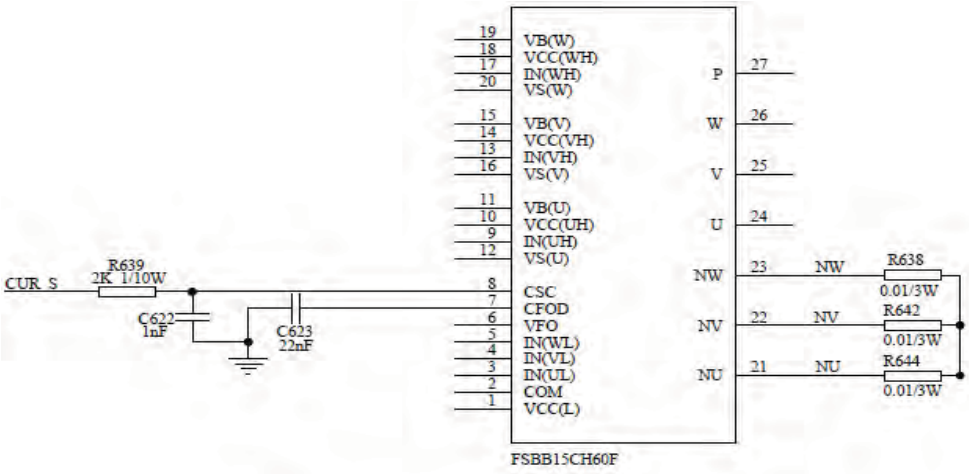


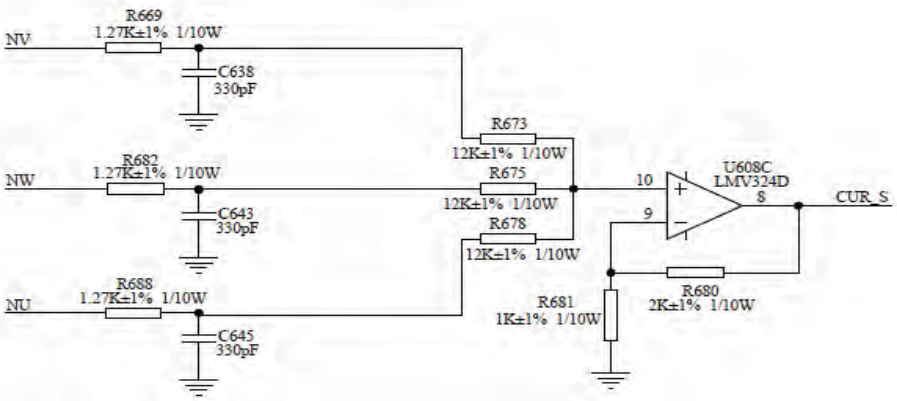
(Figure 36)

3.1.2 Compressor over current detection circuit

When a current of about 25 A or higher flows through the shunt resistance (R638,R642,R644) on the control printed circuit board (PCB), the voltage at this resistance is input to IPM CSC pin (8). Then the gate voltage of the lower-phase IGBT (LU, LV, LW) inside the IPM turns OFF to cut off the over current. At the same time, an L output of about 2ms is generated from IPM VFO pin (6), and this results in an L input to overcurrent detection input VFO of the microcomputer and turns OFF the PWM signal output through to the IGBT gate.


Lower arms control input
c6
c7
Protection circuit state
SET
RESET
Internal IGBT Gate-Emitter Voltage
c4
c3
c2
SC
c1
Output Current
c8
Sensing Voltage of the shunt resistance
SC Reference Voltage
CR circuit time constant delay
Fault Output Signal
c5


VB(W)
VCC(WH)
IN(WH)
VS(W)
VB(V)
VCC(VH)
IN(VH)
VS(V)
VB(U)
VCC(UH)
IN(UH)
VS(U)
CSC
CFOD
VFO
IN(WL)
IN(VL)
IN(UL)
COM
VCC(L)
P
W
V
U
NW
NV
NU
CUR_S
R639
2K 1/10W
C622
1nF
C623
22nF
R638
0.01/3W
R642
0.01/3W
R644
0.01/3W
FSBB15CH60F


R669
1.27K±1% 1/10W
C638
330pF
R682
1.27K±1% 1/10W
C643
330pF
R688
1.27K±1% 1/10W
C645
330pF
R673
12K±1% 1/10W
R675
12K±1% 1/10W
R678
12K±1% 1/10W
U608C
LMV324D
R681
1K±1% 1/10W
R680
2K±1% 1/10W
CUR_S

CHAPTER 3. FUNCTION AND OPERATION OF PROTECTIVE PROCEDURES

[1] PRETECTION DEVICE FUNCTIONS AND OPERATIONS

FUNTION		Operation				Self-daignosis result display	
		Description	Detection period	Reset condition	Indoor unit error display	Indoor unit	Outdoor unit
1	Compressor discharge over heat shut-down	Discharge temperature≥TP2 (95℃), forbid the frequency raise. Discharge temperature≥TP3 (100℃),drop the operating frequency. If discharge temperature over 105℃, shut-down the compressor,outdoor fan motor stops after 15 seconds.	When compressor is in operation	Discharge temperature is below than TP2-2℃. Discharge temperature ＜ TP2(95℃). Discharge temperature ＜ TP1(90℃) and after compressor stops for 3 minutes.	P4	none	yes
2	Compressor delaye operation	The compressor delayes 3 minutes to restart	When the compressor stopes	The compressor stops for 3 minutes	none	none	none
3	Lower voltage preventiion	The unit stops if AC ≤ 158V	When the unit in operation	When AC≥162V	P1	none	yes
4	Higher voltage preventiong	The unit stops if AC≥265V	When the machine in operation	When AC≤260V	P1	none	yes
5	Over current	When the outdoor current ≥I_{max},the compressor stops and outdoor motor stops after 15 seconds	When the machine in operation	When the outdoor current＜I normal	P2	none	yes
6	Compressor drive	If the system can't check the feed-back signal of compressor or load is exceptonal or driver fail then shut down the outdoor unit	When the compressor drives or operates.	Operation offf of on	P9	none	yes
7	Indoor unit evaporator frezze prevention	Compressor stops if indoor pipe temperature IPT≤-1 ℃ and remains 5minutes	When in cooling or dehumidifying operation	Automatic reset when indoor pipe temperature IPT ≥6 ℃ and remains 10 minutes	P5	none	yes
8	Outdoor unit overheat prevention	Compressor shtops if the outdoor unit heatexchanger temperature OPT≥TOP4	When the unit in operation	When the outdoor pipe temperature OPT≤TOP1	P6 outdoor light flash 5cycle	none	yes
9	Indoor unit overheat prevention	Compressor stops if indoor exchaege temperature IPT≥TIP4	When the unit is in operation	When the indoor pipe temperature IPT≤TIP1	P7	yes	none
10	IPM pretector	The outdoor unit shutt down if the IPM checks the temperature of IPM itself or the current is too high	When the unit is in operation	When the IPM chck the temperature of IPM itself or the current fall to normal	P0	none	yes
11	Outdoor unit heat exchanger thermistor short-circuit	Indoor and outdoor unit stops if there is short-circuit or break in outdoor unit heat exchanger thermistor	At compressor startup	Operation OFF or ON	E3	yes	yes
12	Outdoor unit outside air temperature thermistor open-circuit error	Indoor and outdoor unit stops if there is short-circuit or break in outdoor unit heat exchanger thermistor	At compressor startup	Operation OFF or ON	E8	yes	yes

		Description	Detection period	Reset condition	Indoor unit error display	Indoor unit	Outdoor unit
13	Outdoor unit discharge thermistor open-circuit error	Indoor and outdoor unit stops if there is short-circuit or break in outdoor unit heat exchanger thermistor	At compressor startup	Operation OFF or ON	E3	yes	yes
14	Outdoor unit outside air temperature ther-mistor short-circuit error	Indoor and outdoor unit stops if there is short-circuit or break in outdoor unit heat exchanger thermistor	At compressor startup	Operation OFF or ON	E8	yes	yes
15	Discharge pipe temperature themister short-circuit error	Indoor and outdoor unit stops if there is short-circuit or break in outdoor unit heat exchanger thermistor	At compressor startup	Operation OFF or ON	E8	yes	yes
16	Discharge pipe temperature themister open-circuit error	Indoor and outdoor unit stops if there is short-circuit or break in outdoor unit heat exchanger thermistor	At compressor startup	Operation OFF or ON	E8	yes	yes
17	Serial signal error	Indoor and outdoor unit stops if outdoor unit cannot receive serial signal from indoor unit for 2minutes.	When in operation	Reset after reception of serial signal	E0	yes	yes
18	Outdoor unit DC fan error	Operation stops if there is no input of rotation pulse signal from out-door unit fan motor for 30 seconds	When outdoor unit fan is in operation	Operation OFF or ON	EF	yes	yes

[2] AIR CONDITIONER OPERATION IN THERMISTOR ERROR

1. Indoor unit

Item	Mode	Control operation	When resistance is low (tempera-ture judged higher than actual)	Short-circuit	When resistance is high (tempera-ture judged lower than actual)	Open-circuit
Room tempe-rature ther-mistor (TH1)	Auto	Operation mode judgment	Cooling mode is activated even if room temperature is low.	The unit stops	Heating mode is activated even if room temperature is high.	The unit stops
	Cooling	Frequency con-trol	Room becomes too cold	The unit stops	Room does not become cool.	The unit stops
	Dehumidifying	Room temperature memory frequency control	Normal operation.	The unit stops	Normal operation.	The unit stops
	Heating	Frequency control	Room does not become warm	The unit stops	Room becomes too warm.	The unit stops
Heat exchanger thermistor (TH2)	Cooling Drying	Freeze prevention	Indoor unit evaporator may freeze.	The unit stops	Compressor stops occasionally.	The unit stops
	Heating	Cold air prevention	Cold air prevention deactivates too soon and cold air discharges.	The unit stops	Cold air prevention deactivates too slow.	The unit stops

2. Outdoor unit

Item	Mode	Control operation	When resistance is low (tempera-ture judged higher than actual)	Short-circuit	When resistance is high (tempera-ture judged lower than actual)	Open-circuit
Compressor discharge pipe thermistor (TH1)	Cooling Dyring Heating	Expansion valve control and compressor protection	Compressor operates, but room does not become cool or warm	Compressor discharge pipe temperature error indica-tion.	Layer short-circuit or open-circuit may result in compres-sor in normal oper-ation.	Compressor discharge pipe temperature error indica-tion.
Heat exchanger thermistor (TH2)	Cooling Drying	Outdoor unit heat exchanger over heat prevention	Compressor operates at low speed or stops.	Outdoor unit thermistor short-circuit error indication.	Normal operation.	Outdoor unit thermistor open-circuit error indication.
	Heating	Expansion valve control Defrosting	Defrosting operation is not activated as needed, and frost accumulates on outdoor unit	Outdoor unit thermistor short-circuit error indication.	Defrosting operation is activated unnece-ssarily, and room does not become warm	Outdoor unit thermistor short-circuit error indication.
Outside air temper-ature thermistor (TH3)	Auto	Operation mode judgement	Cooling mode is activated even if room temperature is low.	Outdoor unit thermistor short-circuit error indication.	Heating mode is activated even if room temperature is high.	Outdoor unit thermistor open-circuit error indication.
	Cooling Drying	Operation not affected	Normal operation.	Outdoor unit thermistor short -circuit error indication.	Normal operation.	Outdoor unit thermistor open -circuit error indication.
	Heating	Rating controlDefrosting	Defrosting operation is activated unnecessarily.	Outdoor unit ther-mistor short -circuit error indication.	Defrosting operation is not activated, and frost accumulates on outdoor unit.	Outdoor unit thermistor open-circuit error indication.

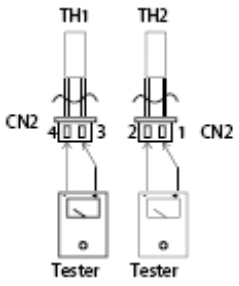
[3] THERMISTOR TEMPERATURE CHARACTERISTICS

1. Indoor unit and outdoor exchange temperature and outside air temperature thermistor temperature characteristics

TEMP.	Resistance (k Ohm)	Votalge of resisitance	TEMP.	Resistance (k Ohm)	Votalge of resisitance	TEMP.	Resistance (k Ohm)	Votalge of resisitance
-30	63.513	4.628	15	7.447	2.968	60	1.464	1.115
-29	60.135	4.609	16	7.148	2.918	61	1.418	1.088
-28	56.956	4.589	17	6.863	2.868	62	1.374	1.061
-27	53.963	4.568	18	6.591	2.819	63	1.331	1.035
-26	51.144	4.547	19	6.332	2.769	64	1.290	1.009
-25	48.488	4.524	20	6.084	2.720	65	1.250	0.984
-24	45.985	4.501	21	5.847	2.671	66	1.212	0.960
-23	43.627	4.477	22	5.621	2.621	67	1.175	0.936
-22	41.403	4.452	23	5.404	2.572	68	1.139	0.913
-21	39.305	4.426	24	5.198	2.524	69	1.105	0.890
-20	37.326	4.399	25	5.000	2.475	70	1.072	0.868
-19	35.458	4.371	26	4.811	2.427	71	1.040	0.847
-18	33.695	4.343	27	4.630	2.379	72	1.009	0.825
-17	32.030	4.313	28	4.457	2.332	73	0.979	0.805
-16	30.458	4.283	29	4.292	2.285	74	0.950	0.785
-15	28.972	4.252	30	4.133	2.238	75	0.922	0.765
-14	27.567	4.219	31	3.981	2.192	76	0.895	0.746
-13	26.239	4.186	32	3.836	2.146	77	0.869	0.728

TEMP.	Resistance (k Ohm)	Votalge of resisitance	TEMP.	Resistance (k Ohm)	Votalge of resisitance	TEMP.	Resistance R(k Ohm)	Votalge of resisitance
-12	24.984	4.152	33	3.697	2.101	78	0.843	0.710
-11	23.795	4.117	34	3.563	2.057	79	0.819	0.692
-10	22.671	4.082	35	3.435	2.012	80	0.795	0.675
-9	21.606	4.045	36	3.313	1.969	81	0.773	0.658
-8	20.598	4.008	37	3.195	1.926	82	0.751	0.641
-7	19.644	3.969	38	3.082	1.883	83	0.729	0.625
-6	18.732	3.930	39	2.974	1.842	84	0.709	0.610
-5	17.881	3.890	40	2.870	1.800	85	0.689	0.595
-4	17.068	3.850	41	2.770	1.760	86	0.669	0.580
-3	16.297	3.808	42	2.674	1.720	87	0.651	0.566
-2	15.565	3.766	43	2.583	1.681	88	0.633	0.552
-1	14.871	3.723	44	2.494	1.642	89	0.615	0.538
0	14.212	3.680	45	2.410	1.604	90	0.598	0.525
1	13.586	3.635	46	2.328	1.567	91	0.582	0.512
2	12.991	3.590	47	2.250	1.530	92	0.566	0.499
3	12.426	3.545	48	2.174	1.495	93	0.550	0.487
4	11.889	3.499	49	2.102	1.459	94	0.535	0.475
5	11.378	3.452	50	2.032	1.425	95	0.521	0.463
6	10.893	3.406	51	1.965	1.391	96	0.507	0.452
7	10.431	3.358	52	1.901	1.357	97	0.493	0.441
8	9.991	3.310	53	1.839	1.325	98	0.480	0.430
9	9.573	3.262	54	1.779	1.293	99	0.467	0.419
10	9.174	3.214	55	1.721	1.262	100	0.455	0.409
11	8.795	3.165	56	1.666	1.231			
12	8.433	3.116	57	1.613	1.201			
13	8.089	3.067	58	1.561	1.172			
14	7.760	3.017	59	1.512	1.143			

Resistance at 25℃: 5 kΩ.



TH1: indoor room temperature thermistor and outside air temperature thermistor

TH2: indoor exchange temperature themistor and outside exchange temperature thermistor

Before measuring resistance,disconnect connectors as shown above.

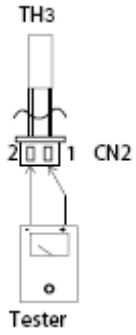
2. Outdoor unit thermistor temperature characteristics

TEMP.	Rmin (k Ohm)	R(t) (k Ohm)	Rmax (k Ohm)	TEMP.	Rmin (k Ohm)	R(t) (k Ohm)	Rmax (k Ohm)	TEMP.	Rmin (k Ohm)	R(t) (k Ohm)	Rmax (k Ohm)
-30	283.3	322.9	367.7	24	19.36	20.89	22.52	78	2.563	2.654	2.745
-29	267.4	304.4	346.3	25	18.55	20	21.54	79	2.481	2.567	2.654
-28	252.5	287.1	307.4	26	17.77	19.14	20.6	80	2.402	2.484	2.567
-27	238.5	270.9	307.4	27	17.03	18.32	19.7	81	2.327	2.404	2.483
-26	225.4	255.7	289.8	28	16.32	17.55	18.85	82	2.254	2.327	2.401
-25	213.1	241.4	273.3	29	15.65	16.81	18.04	83	2.183	2.253	2.323
-24	201.5	228	257.9	30	15	16.1	17.27	84	2.115	2.182	2.248
-23	190.6	215.5	243.4	31	14.39	15.43	16.54	85	2.05	2.113	2.176
-22	180.3	203.6	229.8	32	13.81	14.79	15.34	86	1.985	2.047	2.109
-21	170.7	192.5	217	33	13.25	14.18	15.17	87	1.922	1.983	2.045
-20	161.6	182.1	205	34	12.72	13.6	14.54	88	1.861	1.922	1.983
-19	153.1	172.3	193.7	35	12.21	13.05	13.93	89	1.802	1.862	1.923
-18	145	163.1	183.2	36	11.72	12.52	13.36	90	1.746	1.805	1.865
-17	137.5	154.4	173.2	37	11.26	12.01	12.81	91	1.692	1.75	1.809
-16	130.3	146.2	163.9	38	10.82	11.53	12.29	92	1.639	1.697	1.755
-15	123.6	138.5	155.1	39	10.29	11.07	11.78	93	1.589	1.646	1.703
-14	117.3	131.3	146.8	40	9.986	10.63	11.31	94	1.54	1.596	1.653
-13	111.3	124.4	139	41	9.6	10.21	10.85	95	1.493	1.549	1.604
-12	105.6	118	131.7	42	9.231	9.813	10.42	96	1.448	1.502	1.558
-11	100.3	111.9	124.7	43	8.878	9.43	10	97	1.404	1.458	1.512
-10	95.24	106.2	118.2	44	8.54	9.064	9.612	98	1.362	1.415	1.469
-9	90.49	100.8	112.1	45	8.217	8.714	9.233	99	1.321	1.373	1.426
-8	85.99	95.68	106.3	46	7.908	8.38	8.872	100	1.284	1.335	1.387
-7	81.75	90.86	100.8	47	7.612	8.06	8.526	101	1.245	1.296	1.348
-6	77.74	86.31	95.74	48	7.328	7.754	8.196	102	1.209	1.258	1.309
-5	73.94	82.01	90.88	49	7.057	7.461	7.88	103	1.173	1.222	1.272
-4	70.35	77.95	86.29	50	6.797	7.18	7.578	104	1.139	1.187	1.236
-3	66.96	74.11	81.96	51	6.548	6.912	7.289	105	1.105	1.153	1.202
-2	63.74	70.48	77.87	52	6.309	6.655	7.013	106	1.073	1.12	1.168
-1	60.69	67.05	74	53	6.08	6.409	6.748	107	1.042	1.089	1.136
0	57.81	63.8	70.34	54	5.861	6.173	6.495	108	1.013	1.058	1.104
1	55.08	60.72	66.88	55	5.651	5.947	6.253	109	0.9833	1.028	1.074
2	52.49	57.81	63.61	56	5.449	5.73	6.02	110	0.9553	0.9997	1.045
3	50.03	55.05	60.52	57	5.255	5.522	5.798	111	0.9283	0.9719	1.016
4	47.71	52.44	57.59	58	5.07	5.323	5.585	112	0.9021	0.9451	0.9892
5	45.5	49.97	54.82	59	4.891	5.132	5.381	113	0.8765	0.9191	0.9626
6	43.41	47.62	52.2	60	4.72	4.949	5.101	114	0.8524	0.894	0.9367
7	41.42	45.4	49.71	61	4.556	4.774	4.997	115	0.8087	0.8595	0.9117
8	39.53	43.2	42.33	62	4.398	4.605	4.817	116	0.8059	0.8461	0.8875
9	37.74	41.29	45.12	63	4.247	4.448	4.644	117	0.7837	0.8233	0.8641
10	36.04	39.39	43.01	64	4.101	4.288	4.479	118	0.7623	0.8012	0.8413
11	34.42	37.59	41	65	3.961	4.139	4.32	119	0.7415	0.7798	0.8193
12	32.89	35.87	39.1	66	3.827	3.995	4.167	120			
13	31.43	34.25	37.29	67	3.698	3.858	4.021	121	0.702	0.7386	0.7773

TEMP.	Rmin (k Ohm)	R(t) (k Ohm)	Rmax (k Ohm)	TEMP.	Rmin (k Ohm)	R(t) (k Ohm)	Rmax (k Ohm)	TEMP.	Rmin (k Ohm)	R(t) (k Ohm)	Rmax (k Ohm)
14	30.04	32.71	35.58	68				122	0.6631	0.7195	0.7572
15	29.72	31.24	33.95	69				123	0.6649	0.7007	0.7378
16				70	3.339	3.476	3.616	124	0.6472	0.6824	0.7189
17				71	3.229	3.359	3.491	125	0.6301	0.6647	0.7006
18	25.13	27.26	29.55	72	3.122	3.246	3.372	126	0.6135	0.6476	0.6829
19	24.05	26.07	28.23	73	3.02	3.138	3.257	127	0.5974	0.6309	0.6657
20	23.02	24.93	26.97	74	2.921	3.033	3.146	128	0.5818	0.6148	0.649
21	22.04	23.84	25.77	75	2.827	2.933	3.04	129	0.5667	0.5991	0.6328
22	21.1	22.81	24.63	76	2.735	2.836	2.938	130	0.5521	0.5839	0.6171
23	20.21	21.83	23.55	77	2.647	2.743	2.84				

R—Resistance

Rrsistance at 25℃:20 kΩ



TH3: Outdoor unit discharge pipe thermistor

Before measuring resistance,disconnect connectors as shown above.

[4] GENERAL TROUBLESHOOTING CHART

1. Indoor unit does not turn on

Main cause	Inspection method	Normal value/condition	Remedy
Cracked PCB. (Cracked pattern)	Check visually.	There should be no cracking in PCB or pattern.	Replace PCB.
Open-circuit in FU1 (250 V, 3.15A).	Check melting of FU1.	There should be no open-circuit.	Replace PCB.

2. Indoor unit fan does not operate

Main cause	Inspection method	Normal value/condition	Remedy
Open-circuit in heat exchanger thermistor (TH2)	Measure thermistor resistance (dismount for check).	Refer to themistor temperature characteristic	Replace thermistor.
		There should be no open-circuit or faulty contact.	Replace thermistor.
Disconnected heat exchanger thermistor (TH2)	Inspect connector on PCB.Check thermistor installation con-dition.	Thermistor should not be disconnected.	Install correctly.

3. Indoor unit fan speed does not change

Main cause	Inspection method	Normal value/condition	Remedy
Remote control not designed to allow fan speed change.	Check operation mode.	Fan speed should change except during dehumidifying operation, sleep operation,internally normal operation	Explain to user.

4. Remote control signal is not received

Main cause	Inspection method	Normal value/condition	Remedy
Batteries at end of service life.	Measure battery voltage.	2.5 V or higher (two batteries in series connection)	Install new batteries.
Batteries installed incorrectly.	Check battery direction.	As indicated on battery compartment.	Install batteries in indicated direction.
Lighting fixture is too close, or fluorescent lamp is burning out.	Turn off light and check.	Signal should be received when light is turned off.	Change light position or install new fluorescent lamp.
Operating position/angle is inap-propriate.	Operate within range specified in manual.	Signal should be received within range specified in manual.	Explain appropriate handling to user.
Open-circuit or short-circuit in wiring of light receiving section.	Check if wires of light receiving section are caught.	Wires of light receiving section should not have any damage caused by pinching.	Replace wires of light receiving section.
Defective light receiving unit.	Check signal receiving circuit	Tester indicator should move when signal is received.	Replace PCB.
Dew condensation on light receiving unit.	Check for water and rust.	Signal should be received within range specified in manual.	Take moisture-proof measure for lead wire outlet of light receiving section.

5. Vane do not move

Main cause	Inspection method	Normal value/condition	Remedy
Caught in sliding section.	Operate to see if vane are caught in place.	Vane should operate smoothly.	Remove or correct catching section.
Disconnected connector (CN5 on relay PCB, louver motor side)	Inspect connectors.	Connectors or pins should not be disconnected.	Install correctly.
Contact of solder on PCB(connector section on PCB)	Check visually.	There should not be solder contact.	Correct contacting section.

6. Compressor does not start

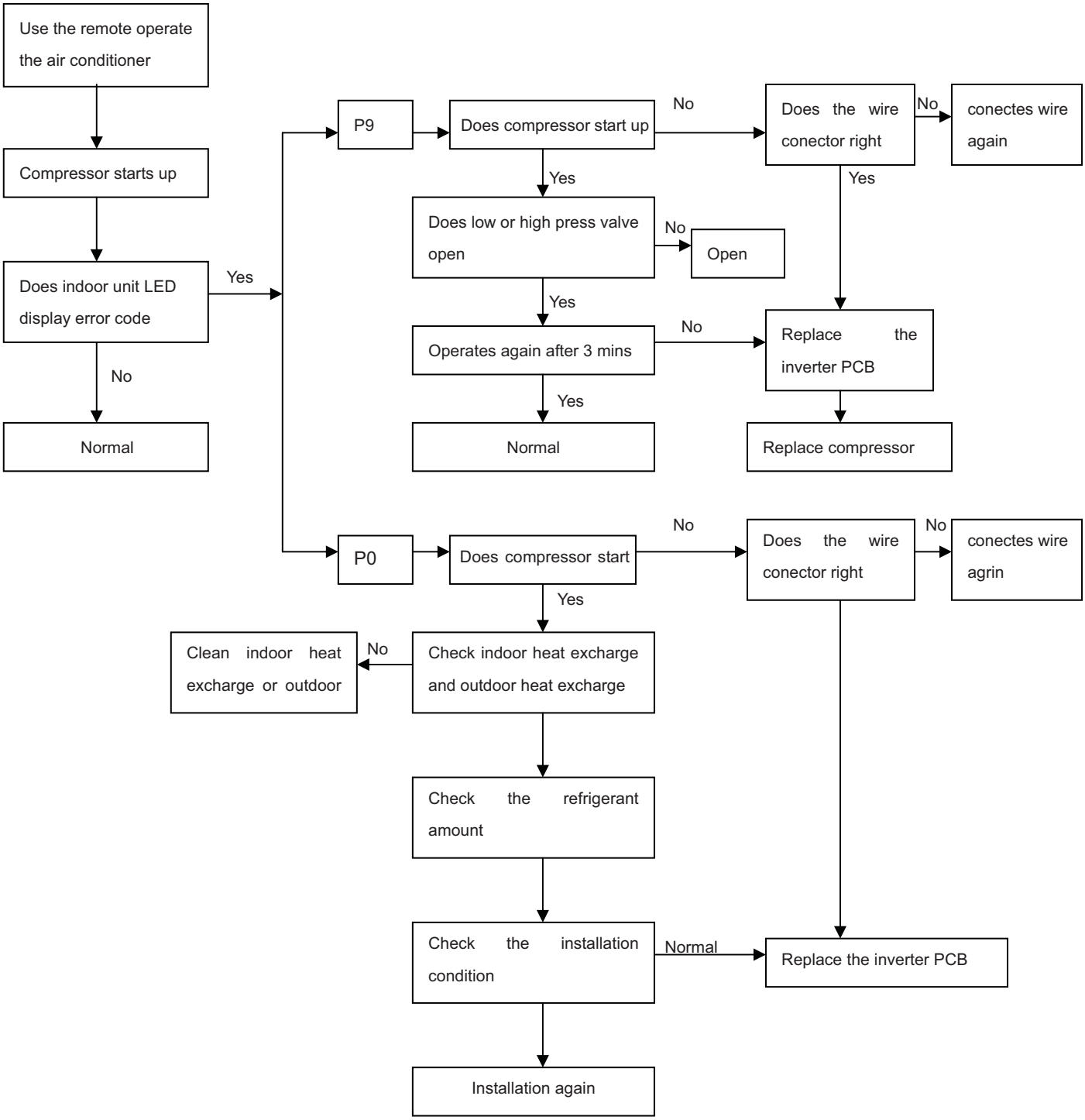
Main cause	Inspection method	Normal value/condition	Remedy
Erroneous inter-unit connection.	Check wiring between indoor and outdoor units.	Terminal board 1-N: 230 VAC, 50 Hz	Correct wiring.
DamageD IPM	Check IPM continuity		Replace IPM

Main cause	Inspection method	Normal value/condition	Remedy
Blown outdoor unit fuse.	Check 20-A fuse.Check 15-A fuse.	Fuse should not be blown.	Replace fuse. Replace outdoor unit PWB assembly.
Power supply voltage is too low.	Measure power supply voltage during startup.	220± 10 VAC, 50 Hz	Make sure that power supply voltage is 198 V or higher.
Compressor lock.	Supply current and touch compressor cover (sound absorbing material) to check if operation starts.	Compressor should start normally.	Apply external impact to compressor.Replace compressor.

[5] MALFUNCTION (PARTS) CHECK METHOD

1. Procedure for determining defective outdoor unit IPM/compressor

The following flow chart shows a procedure for locating the cause of a malfunction when the compressor does not start up and a DC overcurrent indication error occurs.



6. DC Over Current Error

[6] CHART

1. The failure code display(indoor unit)

Fault Type	Function Indicator lamp	Digital LED display
Indoor/outdoor communication fault	RUN&POWER: ON	E0 (Flashing)
Outdoor communication fault	RUN&POWER: ON	EC (Flashing)
Room temperature sensor (IRT)	RUN&POWER: ON	E1 (Flashing)
Indoor pipe (coil) temperature sensor (IPT)	RUN&POWER: ON	E2 (Flashing)
Outdoor pipe (coil) temperature sensor (OPT)	RUN&POWER: ON	E3 (Flashing)
Model configuration wrong	RUN&POWER: ON	E5 (Flashing)
Indoor fan motor fault	RUN&POWER: ON	E6 (Flashing)
Outdoor air temperature sensor	RUN&POWER: ON	E7 (Flashing)
Discharge temperature sensor	RUN&POWER: ON	E8 (Flashing)
IPM of drive and module fault	RUN&POWER: ON	E9 (Flashing)
Outdoor fan motor fault (DC Motor)	RUN&POWER: ON	EF (Flashing)
Current sensor fault	RUN&POWER: ON	EA (Flashing)
EEPROM fault	RUN&POWER: ON	EE (Flashing)
Temperature switch fault (on top of the compressor)	RUN&POWER: ON	EP (Flashing)
Voltage sensor fault	RUN&POWER: ON	EU (Flashing)
Intake temperature sensor	RUN&POWER: ON	EH (Flashing)

2. The failure code display

2.1. Outdoor power supply PCB (The lamp on the outdoor PCB)

Blink times(n)	Fault Message	Blink times(n)	Fault Message
1	IPM protection	17	Defrost state
2	Overvoltage / undervoltage	18	Short-circuit / open-circuit fault of intake temperature sensor
3	Over current	19	Outdoor EEPROM fault
4	Exhaust overtemperature protection	20	Outdoor fan motor protection
5	Outdoor coil overtemperature protection	21	Indoor fan motor protection
6	Drive faulture protection	23	System in shortage of Freon
7	Communication fault with indoor unit	24	Model configuration wrong
8	Compressor overheat fault (compressor top switch)	25	Indoor sensor fault
9	Short-circuit / open-circuit fault of outdoor temperature sensor	26	Indoor coil sensor fault
10	Short circuit / open-circuit fault of outdoor heat exchanger temperature sensor	27	Indoor EEPROM fault
11	Short-circuit / open-circuit fault of discharge temperature sensor	28	Indoor fan motor fault
12	Voltage sensor fault	30	Outdoor drive fault
13	Current sensor fault	31	Outdoor environmental Overtemperature/ undertemperature protection
14	IPM fault	32	Indoor coil deforst prevention
15	communication fault between power source board and intelligent power module	33	Indoor coil overheating protection
16	No feedback from DC fan motor(outdoor unit)		

2.2. Outdoor IPM

Flash times(n)	Fault Message	Blink times(n)	Fault Message
1	IPM protection/failture	13	The phase current of compressor failture
2	DC overhigh/lower voltage	15	communication fault between power source board and intelligent power module
3	Overcurrent of compressor		

Display on outdoor power source board: The indicator alerts the fault in a cycle as such that it is bright for 0.5 seconds, dark for 0.5 seconds, flases"n" times and then dark for 3 seconds.

2.3. Protection Code

Protection Type	Function Indicator (flash)	Digital LED display
Overvoltage / undervoltage protection	RUN: Flaring ; TIMER: 1 time /8 sec	P1
Overcurrent protection	RUN: Flaring; TIMER: 2 times /8 sec	P2
Exhaust overtemperature protection	RUN: Flaring; TIMER: 4 times /8 sec	P4
Subcooling protection under cooling mode	RUN: Bright; TIMER: 5 times /8 sec	P5
Overheating protection under cooling mode	RUN: Bright; TIMER: 6 times /8 sec	P6
Overheating protection under heating mode	RUN: Bright; TIMER: 7 times /8 sec	P7
Outdoor over/ under temperature protection	RUN: Bright; TIMER: 8 times /8 sec	P8
Drive protection (software control)	RUN: Flaring; TIMER: 9 times /8 sec	P9
Module protection (hardware control)	RUN: Flaring; TIMER: 10 times /8 sec	P0

[7] Trouble shooting Guide

According to the fault code

1. **Display E1 or E2**

Problem symptom		Display E1 or E2
Cause		Room temperature thermistor (IRT) and Indoor exchange temperature thermistor (IPT) fault
Malfunction No.	Content of diagnosis	Action
1	Contact between indoor room and exchange temperature thermistor CN6 (RT, IPT) and slot	Insert again if loose.
2	Measure the resistance on the two ends of indoor temperature sensor: (25℃/ 5kΩ). For other resistance, please refer to the temperature – Resistance Sheet	Replace the temperature sensor if the resistance is incurred to drift, open or short circuiting.
3	If the above testing is normal	Replace the indoor control board

2. Display E6

Problem symptom		Display E6
Cause		Indoor fan motor fault
Malfunction No.	Content of diagnosis	Action
1	Check the indoor cross-flow fan blade	If the fan does not run, readjust the fan position until it can run smoothly.
2	If the motor insert (CN3, CN4) on indoor main PCB is in good contact with the slot	Insert again if loose.
3	Startup capacitance value	Capacitance incorrect. Replace with a new capacitor.
4	The above inspections are normal	Replace the indoor main PCB

3. Display E3, E7, E8

Problem symptom		Display E3, E7, E8
Cause		Outdoor exchange temperature thermistor and outdoor air temperature thermistor and discgarge temperature sensor fault
Malfunction No.	Content of diagnosis	Action
1	If the temperature sensor on outdoor power source board is in good contact with the slot (CN1, CN2)	Insert again if loose.
2	Measure the resistance on the two ends of outdoor temperature thermistor: Resistance of CN1 terminal thermistor (25℃ / 5kΩ). For other resistance, please refer to the temperature – Resistance Sheet. Resistance of CN2 terminal thermistor(25℃ / 20kΩ). For other resistance, please refer to the discharge temperature thermistor resistance sheet.	Replace the temperature sensor if the resistance is incurred to drift, open or short circuiting.
3	If the above testing is normal	Outdoor power source board

4. Display EA

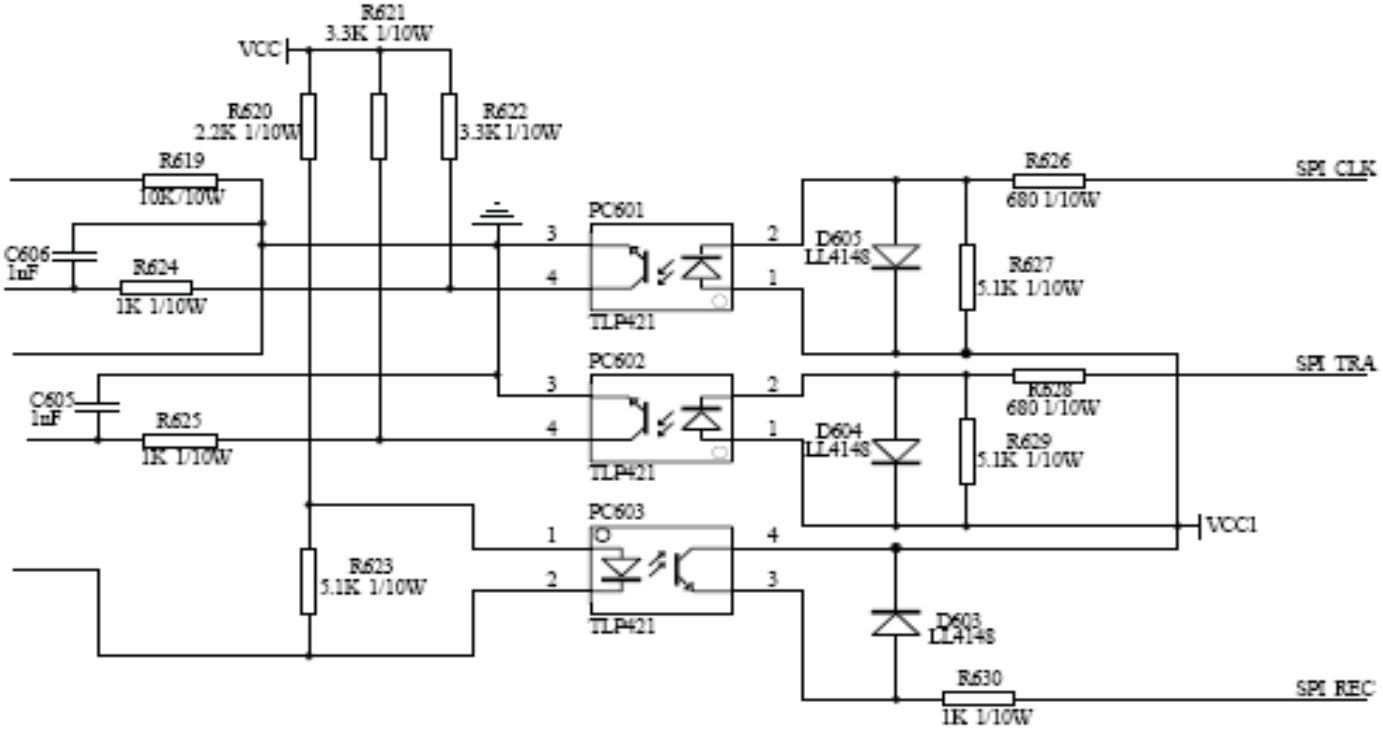
Problem symptom		Display EA
Cause		Current sensor fault
Malfunction No.	Content of diagnosis	Action
1	Check for refrigerant leakage	Find the leakage point and recharge the refrigerant
		Replace the outdoor power source board

5. Display EC

Problem symptom			Display EC	
Cause			Outdoor communication fault between power source board and intelligent power module	
Malfunction No.	Content of diagnosis		Action	
1	Check the contact of communication wire (CN5) between power source board and intelligent power module		Insert again if loose.	
2	After the complete unit is energized, check the indicators on outdoor power source board and intelligent power module	The indicator on power source board flare normal (bright for 1 second and dark for 1 second), but the indicator on intelligent power module does not work normally	Replace the intelligent power module	If the fault remains unsolved, replace the power source board again.
		The indicator on intelligent power module flare normal (bright for 1 second and dark for 1 second), but the indicator on power source board does not work normally	Replace the power source board	If the fault remains unsolved, replace the intelligent power module again.

You can check each voltage of the electrical board communication pin, the normal data is as the following:

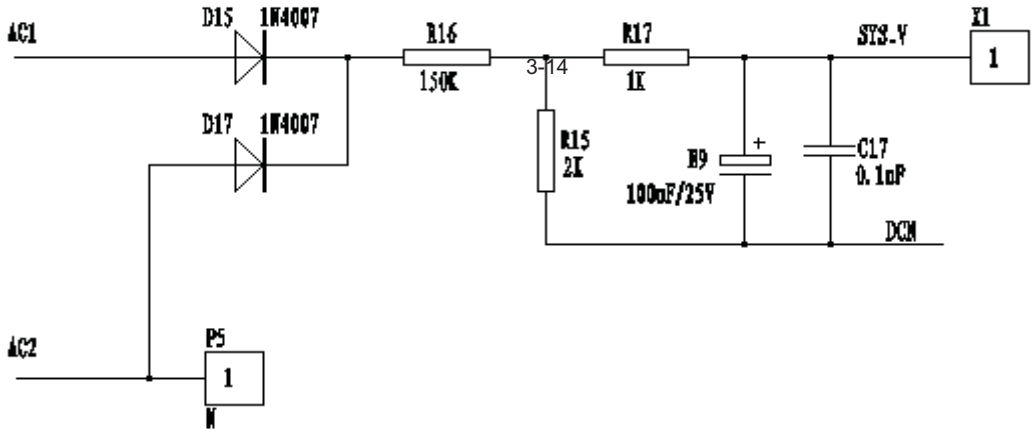
Pin	1	2	3	4	5	6
Voltage(V)	5	1.0-4.8	1.8-4.1	2.6	earthing	15



Outdoor communication circuit

6. Display EU

Problem symptom		Display EU
Cause		Voltage sensor fault
Malfunction No.	Content of diagnosis	Action
1	The outdoor power source bord can't check the voltage, check the votage lower or higher than the protector voltage .	Insert again if loose.
		Replace the outdoor power source board



voltage sampling circuit

7. Display EP

Problem symptom			Display EP
Cause			Temperature switch fault (on top of the compressor)
Malfunction No.	Content of diagnosis		Action
1	Check the insert position CN3 of the compressor top temperature switch wires on outdoor power source board		Insert again if loose.
	No switch on compressor top		Jumper short-circuiting (This function not provided for 1 – 1.5P unit)
2	Compressor temperature. The temperature is very high, accompanied with bad smell.	Check the U, V and W wires of the compressor.	The correct sequence of U. V and W wiring shall be "red, white and blue". Connect again if incorrect.
		Check the system pressure.	The pressure is low. Add refrigerant to ensure the system pressure is normal.
		Check the outdoor ventilation and if there is any obstruction that affects the normal radiating of the air conditioner.	Install to the position as required in the Installation Manual and ensure the air inlet and outlet of the outdoor unit is smooth.
3	Compressor temperature: The temperature is not high. Short circuit CN3.		If the fault is solved after short circuiting, replace the shell temperature switch.
			If the fault remains unsolved after replacing the shell temperature switch, please replace the outdoor power source board.

8. Display P1

Problem symptom		Display P1
Cause		Overvoltage / undervoltage protection
Malfunction No.	Content of diagnosis	Action
1	Test the supply voltage if it is between 160V ～260V（AC）.	It is normal protection if exceeding this range.
2	Test if the voltage between L and N terminal of outdoor unit is within 160V～260V（AC）.	It is normal protection if exceeding this range.
3	If the voltage is normal:	Replace the outdoor power source board

9. Display E9 (Firstly display P0 or P9, then change to E9)

Problem symptom				Display E9 (Firstly display P0 or P9, then change to E9)
Cause				Intelligent power module of drive and module fault
Malfunction No.	Content of diagnosis			Action
1	Re-energize and check the protection code on display. Firstly display P0	If this code is displayed when the compressor is started for several seconds or even not started, check the compressor connection for correctness		If no insert wrong, replace the intelligent power module
		"P0" appears when the air conditioner is working	Check if the outdoor module is tightly installed onto the radiating fins and if the silicone is applied evenly	Fix the screws again if loose.
			Check the system pressure.	Recharge refrigerant if the pressure is low. Discharge some refrigerant if the pressure is too high.
			Check the outdoor ventilation and if there is any obstruction that affects the normal radiating of the air conditioner.	Install to the position as required in the Insallation manual and ensure the air inlet and outlet of the outdoor unit is smooth.
			The above inspections are normal, but the fault remains unsolved	Replace the intelligent power module
2	Re-energize and check the protection code on display. Firstly display P9	If this code is displayed when the compressor is started for several seconds or even not started, check the compressor connection for correctness		If no insert wrong, replace the intelligent power module
		When the compressor is restarted immediately after stop, this might also cause P9 protection because the cooling system is not stable.		Try starting the air conditioner again after a longer period of stop
		P9 appears after the air conditioner is started and has run for a period of time	Cooling / heating is normal during run	Replace the intelligent power module
			If the cooling / heating is abnormal, check the compressor wiring for correctness.	Insert again if loose.

10. Display EE

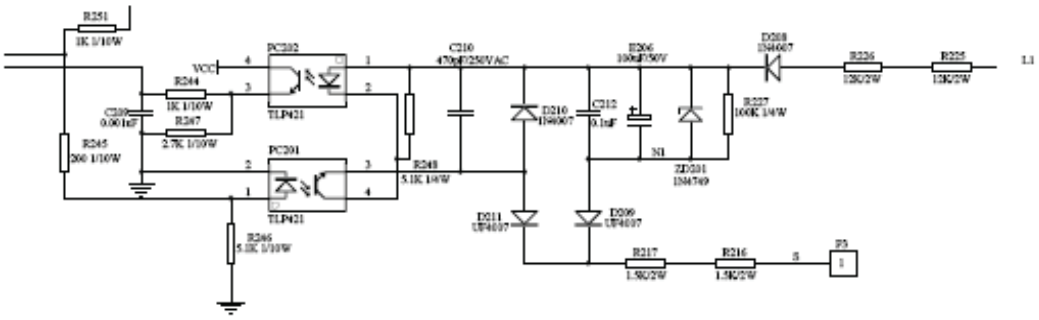
Problem symptom		
Cause		EEPROM fault
Malfunction No.	Content of diagnosis	Action
1	Shut off the power and suplyes again,if EE dispay again:	Replace outdoor power source board

11. Display P1

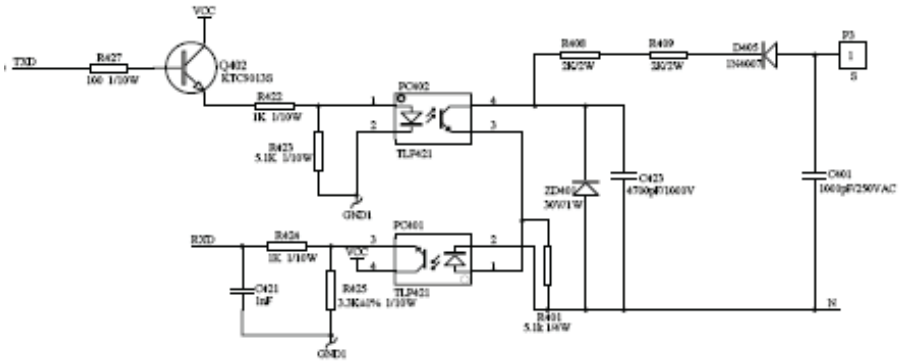
Problem symptom		Display P1
Cause		Overvoltage / undervoltage protection
Malfunction No.	Content of diagnosis	Action
1	Test the supply voltage if it is between 160V ～260V（AC）.	It is normal protection if exceeding this range.
2	Test if the voltage between L and N terminal of outdoor unit is within 160V～260V（AC）.	It is normal protection if exceeding this range.
3	If the voltage is normal	Replace the outdoor power source board

12. Display E0、E5

Problem symptom				Display E0、E5
Cause				Indoor / outdoor communication fault
Malfunction No.	Content of diagnosis			Action
1	Energize and observe for approx. 10 minutes. If E0 is still displayed or changed to E5 after a period of time:	1. Check if the indoor and outdoor connections are correct. The terminal L and N shall correspond to each other on indoor and outdoor units. Measure the voltage on outdoor terminal L and N (before display of E0 fault). If the voltage is “0”:		Replace the indoor main PCB.
		2. If the L & N voltage is normal, measure the voltage between the outdoor terminal N and 1. If the voltage change occurs between 0~24V (change pulse voltage)		Replace the indoor main PCB.
		3. If the L & N voltage is normal, measure the voltage between the outdoor terminal N and 1. If the voltage change occurs between 0~12V change pulse voltage), but there is no 24V:		Replace the outdoor power source board.
		4. If the L & N voltage is normal, measure the voltage between the outdoor terminal N and 1. If the voltage has no change:		Firstly replace the indoor main PCB. If the fault remains unsolved, replace the outdoor power source board.
		5. Indicator on outdoor power source board	1) The indicator is dark: Check IPM board – Test the pins of rectifier bridge, fast recovery diode (FRD) and IGBT elements for any breakdown, short circuiting or damage.	Replace the power source board.
			2) If no damage, test the DC voltage between DC+ and DC-. If the voltage is approx. 310V:	Replace the power source board.
			3) If no damage, test the DC voltage between DC+ and DC-. If the voltage is zero:	Replace the power source board.
		6. If the problem cannot be solved by using the methods above:		Firstly replace the intelligent power module . If the problem remains unsolved, replace the indoor main PCB. Power source board . power factor correction.
		7. If this fault appears at the initial installation and testing of the complete unit		please check if the indoor control board and outdoor inverter module are of the same generation.



The schematic diagram of Indoor unit communication loop



The schematic diagram of the partial outdoor unit communication loop

13. Display P4

Problem symptom		Display P4
Cause		Discharge overtemperature protection
Malfunction No.	Content of diagnosis	Action
1	Check if the air inlet and outlet of outdoor unit is blocked by any obstructions.	Install to the position as required in the Instruction Manual and ensure the air inlet and outlet of the outdoor unit is smooth.
2	Check the system for shortage of refrigerant.	Add refrigerant
3	Check if the exhaust temperature sensor is drifted, short circuited or open circuited. (25℃/20kΩ). For other resistances, please refer to the Exhaust Temperature Sensor – Resistance Sheet)	Replace the exhaust temperature sensor
4	Control board damaged	Replace the outdoor power source board

14. Display P2

Problem symptom		Display P2
Cause		Overcurrent protection
Malfunction No.	Content of diagnosis	Action
1	Check if the outdoor fan motor is stopped due to overheat protection, or damaged, and if the fan capacitor is damaged.	Replace the fan capacitor,replace the outdoor power source board and the damaged outdoor fan motor.

15. Display P5

Problem symptom		Display P5
Cause		Subcooling protection under cooling mode
Malfunction No.	Content of diagnosis	Action
1	Check if the air inlet and outlet of indoor unit is blocked by any obstructions.	Install to the position as required in the Installation manual and ensure the air inlet and outlet of the outdoor unit is smooth.
2	Check the system for shortage of refrigerant.	Add refrigerant
3	Check if the exhaust temperature sensor is drifted, short circuited or open circuited. (Measure the resistance of the resistors on two ends of indoor temperature sensor: (25℃ / 5kΩ). For other resistances, please refer to the Temperature – Resistance Sheet.	Replace room temperature sensor (IRT) and Indoor pipe (coil) temperature sensor (IPT)
4	Control board damaged	Replace the indoor control board

16. Display P6

Problem symptom		Display P6
Cause		Overheating protection under cooling mode
Malfunction No.	Content of diagnosis	Action
1	Check if the air inlet and outlet of outdoor unit is blocked by any obstructions.	Install to the position as required in the Installation manual and ensure the air inlet and outlet of the outdoor unit is smooth.
2	Check the system for shortage of refrigerant.	Add refrigerant
3	Check if the outdoor evaporator coil temperature sensor is drifted, short circuited or open circuited (25℃/5KΩ). For other resistance, please refer to the Temperature – Resistance Sheet.	Replace the outdoor coil temperature sensor
4	Control board damaged	Replace the outdoor power source board

17. Display P7

Problem symptom		Display P7
Cause		Overheating protection under heating mode
Malfunction No.	Content of diagnosis	Action
1	Check if the air inlet and outlet of outdoor unit is blocked by any obstructions.	Install to the position as required in the Installation manual and ensure the air inlet and outlet of the outdoor unit is smooth.
2	Check the system for shortage of refrigerant.	Add refrigerant
3	Check if the indoor exchange temperature thermistor is drifted, short circuited or open circuited. (Measure the resistance of the resistors on two ends of indoor temperature thermistor: (25℃ / 5kΩ). For other resistances, please refer to the Temperature – Resistance Sheet.	Replace the Indoor exchange temperature thermistor(IPT)
4	Control board damaged	Replace the indoor control board

18. Display P8

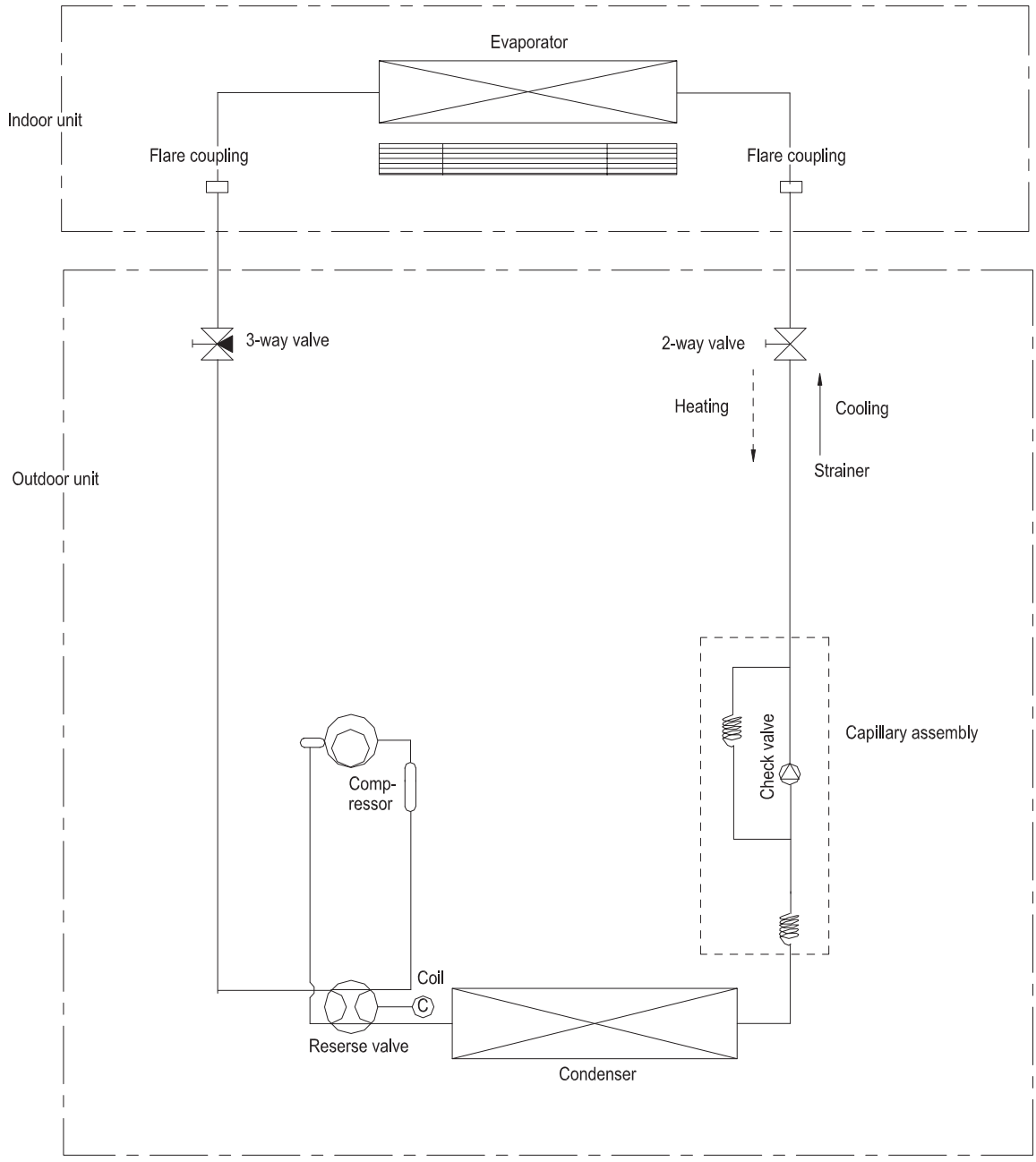
Problem symptom		Display P8
Cause		Outdoor air temperature over/under protection
Malfunction No.	Content of diagnosis	Action
1	The compressor cannot run under cooling mode when the outdoor temperature is lower than -1℃, or run under heating mode when the outdoor temperature is higher than 33℃, whilst the compressor alarms P8 protection.	Normal protection function
2	If the temperature is not within the protective range above, please refer to the Temperature – Resistance Sheet (See Appendix). Use the multimeter to measure the resistors on the two ends of outdoor intake temperature sensor (CN1) (25℃/5kΩ). For other resistance, please refer to the Temperature – Resistance Sheet.	Replace the sensor if it is incurred to drift, open circuiting or short circuiting.
3	If the fault remains unsolved after replacement of the sensor	Replace the outdoor power source board

19. Display P9

<table>
<tr><td colspan="3">Problem symptom</td><td colspan="2">Display E9 (Firstly display P0 or P9, then change to E9)</td></tr>
<tr><td colspan="3">Cause</td><td colspan="2">Intelligent power module of drive and module fault</td></tr>
<tr><td>Malfunction No.</td><td colspan="2">Content of diagnosis</td><td colspan="2">Action</td></tr>
<tr><td rowspan="4">1</td><td rowspan="4">Re-energize and check the protection code on display. Firstly display P9</td><td colspan="2">If this code is displayed when the compressor is started for several seconds or even not started, check the compressor connection for correctness.</td><td>Replace the intelligent power module.(Be sure to apply silicone when replacing the intelligent power module.).</td></tr>
<tr><td rowspan="2">P9 appears after the air conditioner is started and has run for a period of time</td><td>Cooling/heating is normal during run</td><td>Insert again if loose</td></tr>
<tr><td>If the cooling / heating are abnormal, check the compressor wiring for correctness.</td><td>Insert again if loose</td></tr>
<tr><td colspan="2">When the compressor is restarted immediately after stop, this might also cause P9 protection because the cooling system is not stable.</td><td>Try starting the air conditioner again after a longer period of stop</td></tr>
</table>

CHAPTER 4. REFRIGERATION CYCLE

[1] SCHEMATIC DIAGRAM



[2] STANDARD CONDITION

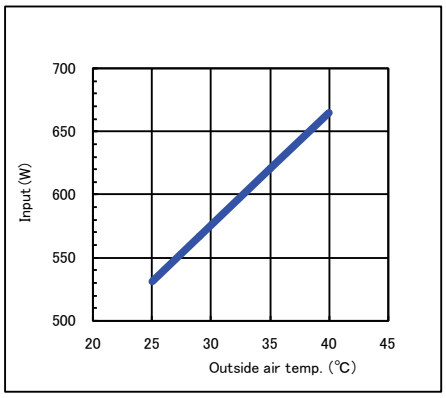
	Indoor side		Outdoor side	
	Dry-bulb Temp. (°C)	**Relative Humidity (%)**	**Dry-bulb Temp. (°C)**	**Relative Humidity (%)**
Cooling	27	47	35	40
Heating	20	——	7	87

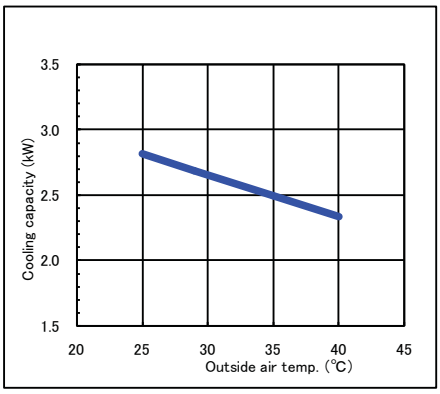
[3] TEMPERATURE AT EACH PART AND PRESSURE IN 3-WAY VALVE

NOTE
1)Indoor fan speed: Hi
2)Vertical adjustment louver "front", Horizontal adjustment louver "level"
3)Indoor air temp. : Cooling 27°C, Heating 20°C
4)Power source : 230V, 50Hz
5)Compressor speed : Rated frequency

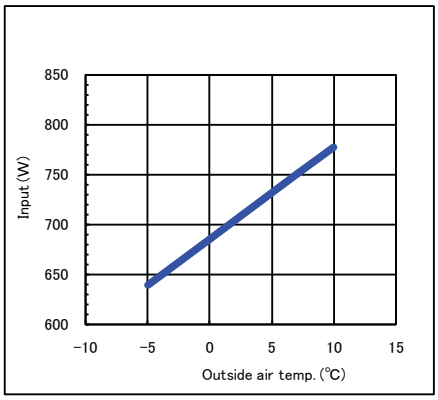
AY-XP9PSR/AE-XP9PSR

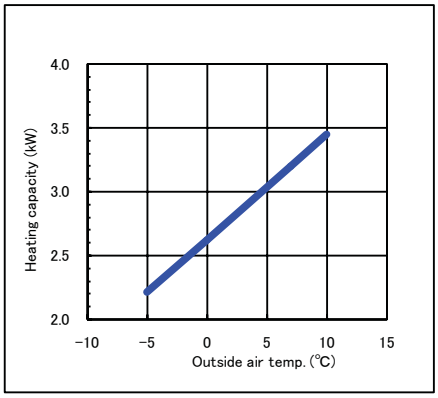
1.1. At Cooling





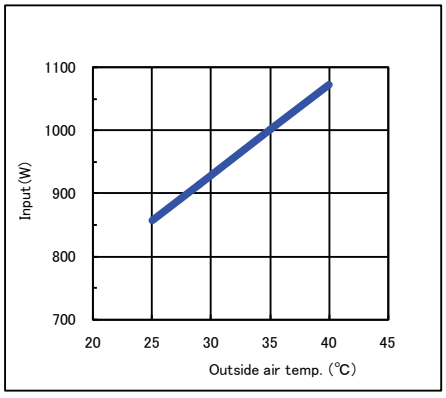
1.2. At Heating

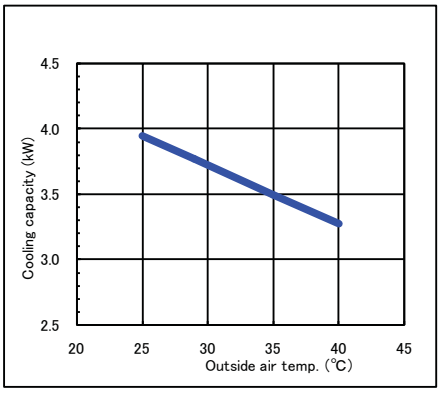




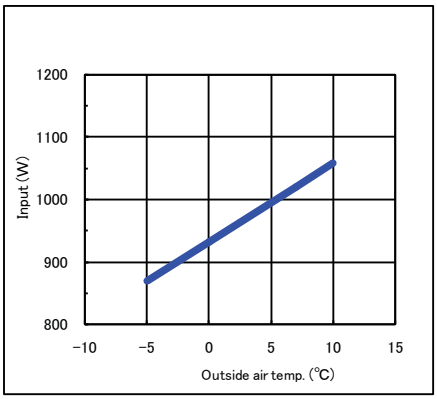
AY-X12PSR/AE-X12PSR

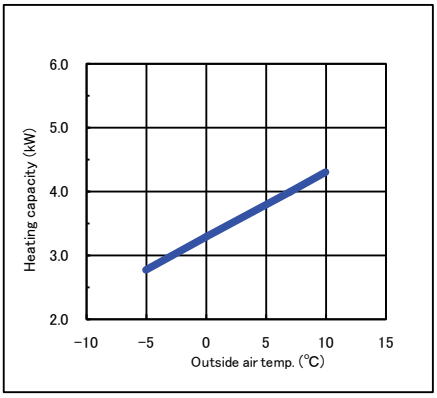
1.1. At Cooling





1.2. At Heating





CHAPTER 5. DISASSEMBLY PROCEDURE

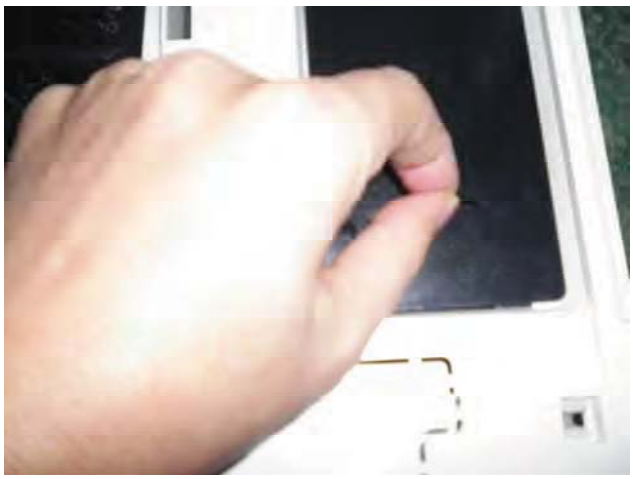
If, in carrying out repairs and modifications, the work requires the use of arc- and flame-producing apparatus, such as welding, brazing and solderingequipment, this work shall only be started after the rooms have been thoroughly ventilated. While the work is being carried out, the mechanical venti-lation, if any, shall be kept in constant operation and all windows and doors kept open. In the case of repairs to parts of the refrigerant circuit, it maybe necessary that not only the workman but also a second person shall be present for observation and assistance.Necessary protective equipment shall be available and, in the case of open flames or arcs, fire extinguishing apparatus shall be ready to hand.Welding and brazing shall be carried out by qualified workmen.

[1] INDOOR UNIT

1) Open the open panel and remove it.

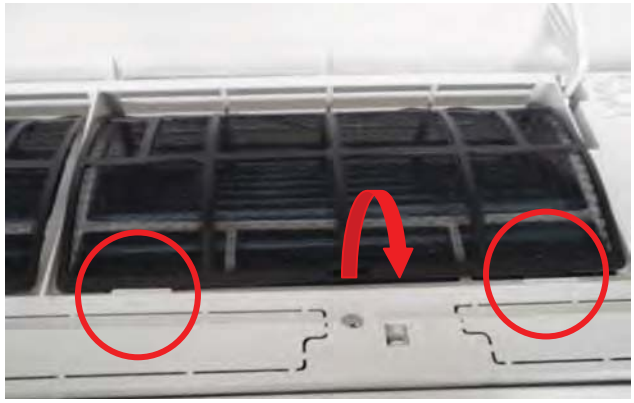
2) Remove a screw fixing the cord holder.

3) Remove the cord holder.

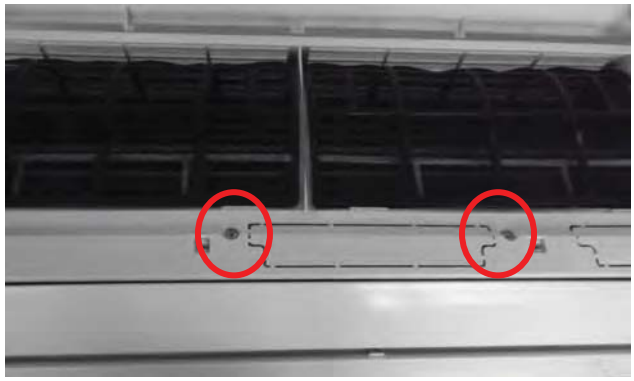


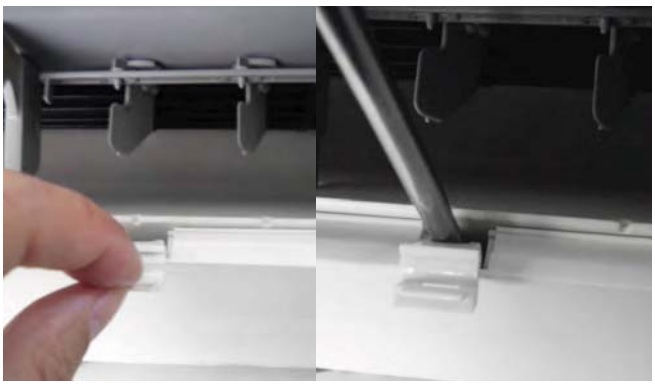
4) Loosen the screws on the terminal board and remove the unit-tounit wiring connected with the board.

5) Slide out the 2 air filters.

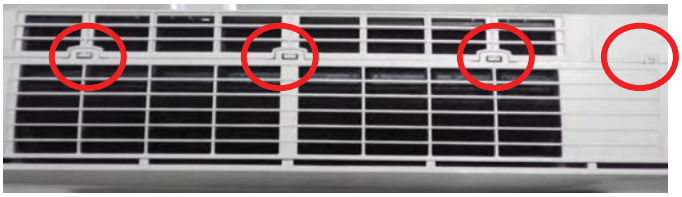


6) Remove 5 screws fixing the front panel.



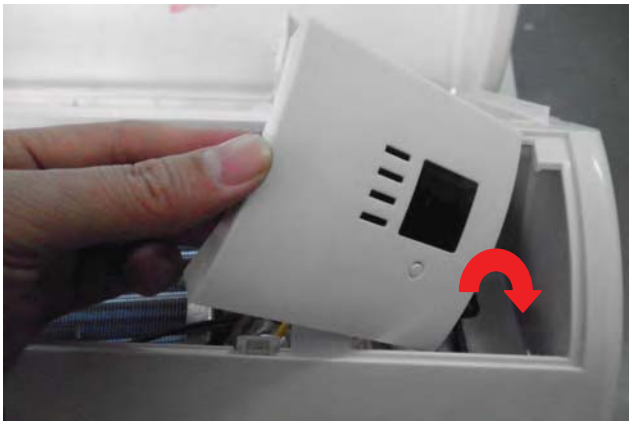


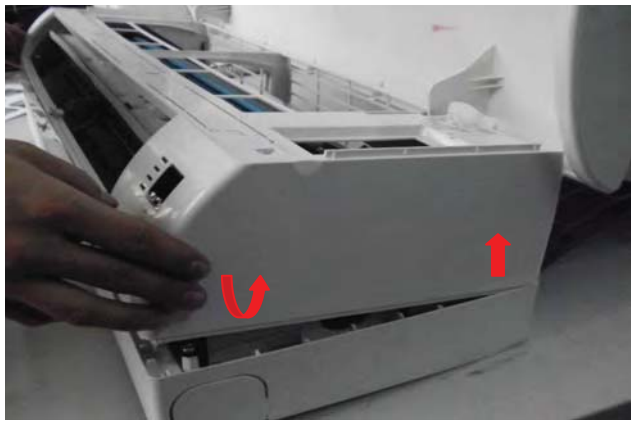
7) Unfasten the front panel and pull forward it slightly. (4 circled spotsin the picture are hooked.)



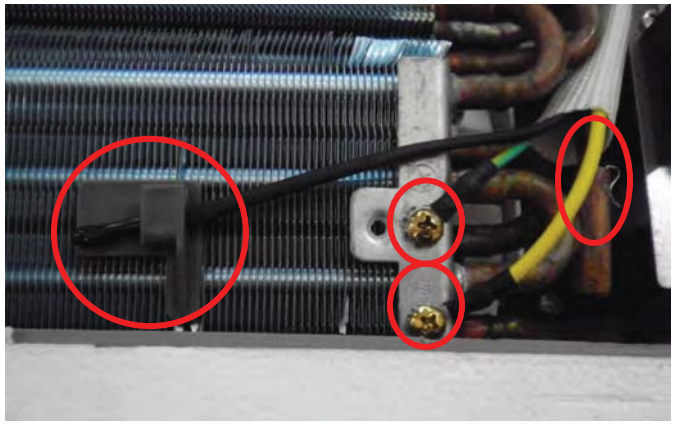
Open the horizontal louver.

Pull the front panel toward in the direction shown the picture.

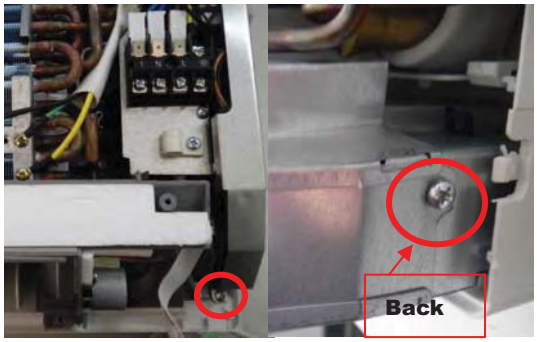




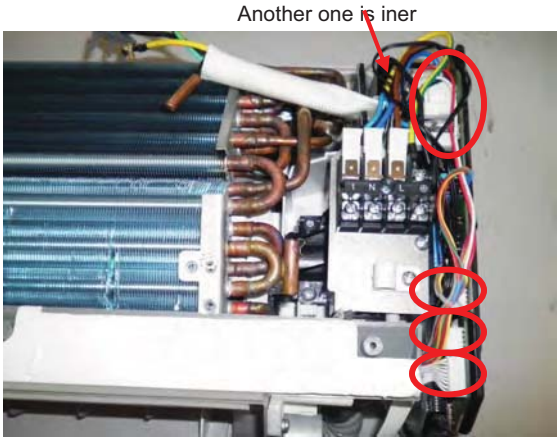
8) Remove the thermistor suppertor and the thermistor clip.Remove a screw fixing the earth wire.

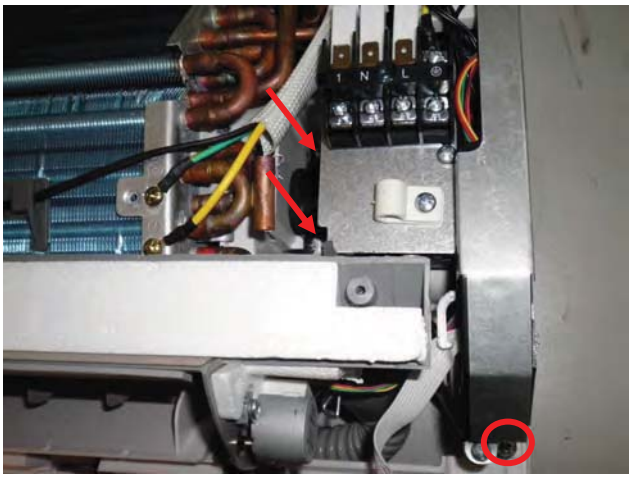


9) Remove the screw fixing on the control box cover from the control box and pull it away.

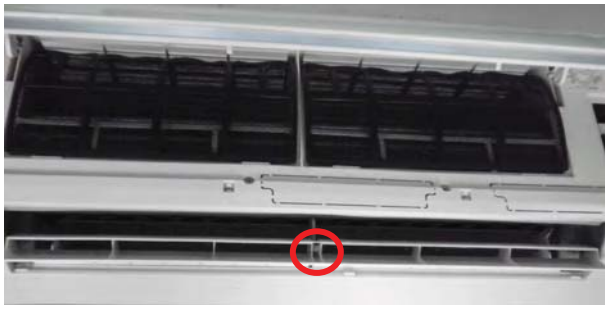


10) Remove the 3 screw and the 5 connectors and remove the control box.

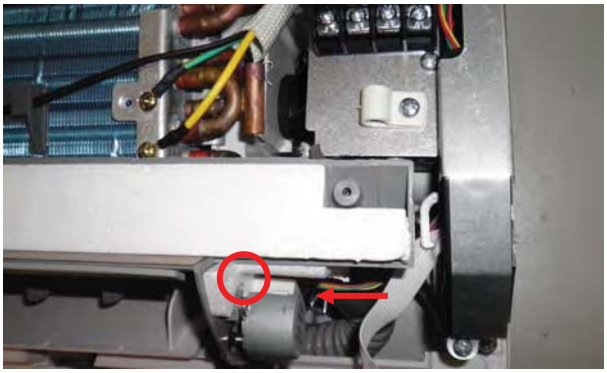




11) Remove the horizontal louver fromcabinet while warping.



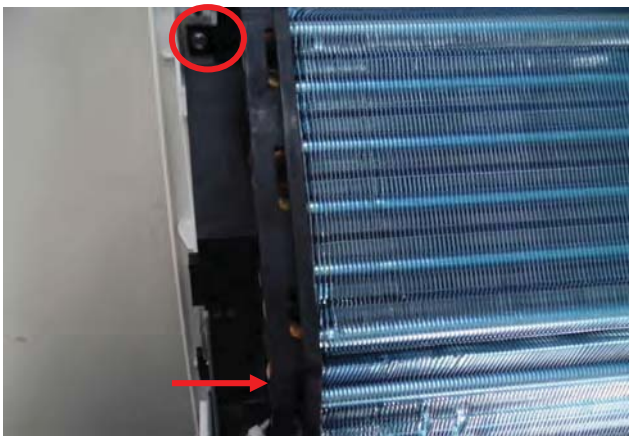
12) Remove the two screw and remove the vane motor.

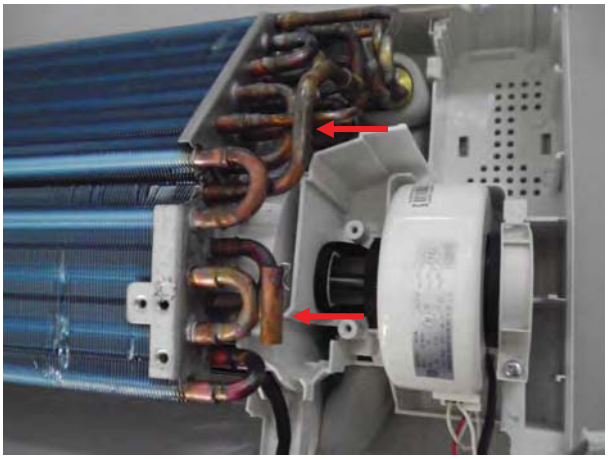


13) Remove the water drainge assembly and take off .

14)

a) Remove the 4 screws fixing the side left and side right.



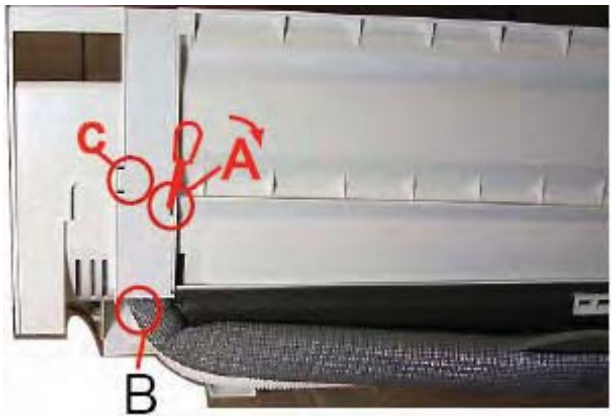


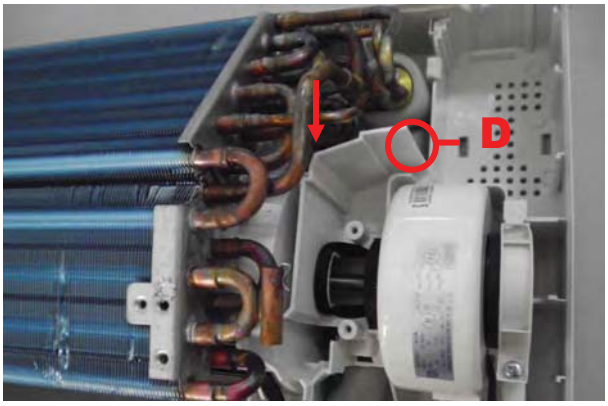
b) Remove the tube cover.

•Insert the (–) screwdriver to A hole, D clip and then lean it to theright as lifting B part.

c) Remove the evaporator from the cabinet.

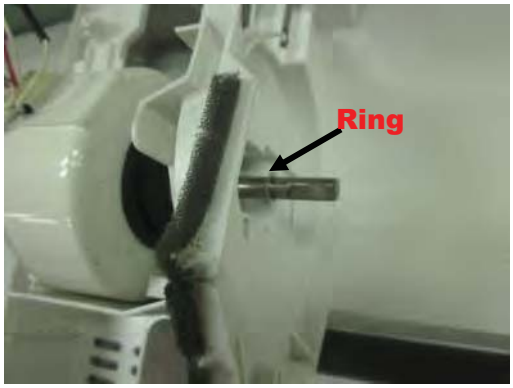
•Take off the catch of the tube cover from the plate and movethe evapo





15) Loosen the screw of cross flow fan and separate the cross flow fan and the fan motor

When assembling them, insert the motor shaft in the boss of thecross flow fan to the ring position.



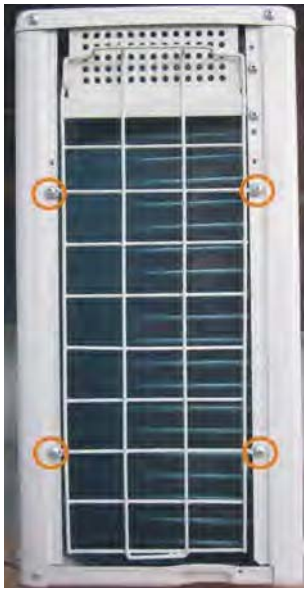
[2] OUTDOOR UNIT

1)The fixed screw of control box cover is removed and control boxcover is removed.

3) The 2 screws on the left-hand side of top plate ass'y is removed.

2)The 2 screws on the right-hand side of top plate ass'y is removed.

4)The screw on the left-hand side of grille is removed



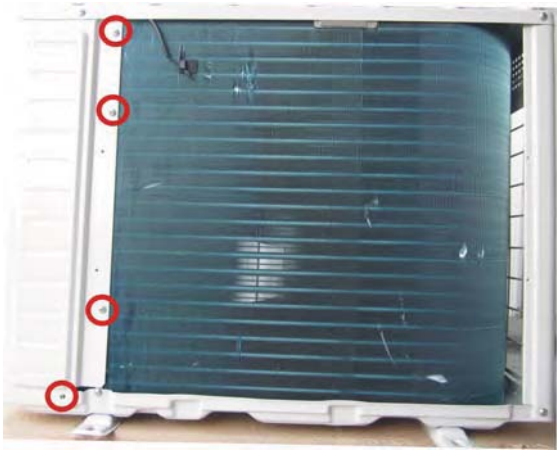
5)The screw on the right-hand side of front panel is removed

6)The screw on the left-hand side of front panel is removed

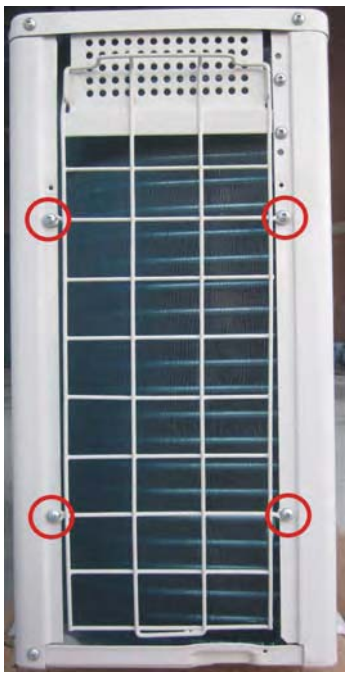
7) The 3 screws of the front of a front panel is removed.

8)The 5 screws on the right-hand side of right plate is removed.

9) Unscrew the 4 screws on the back side of of right plate and removed the right plate.

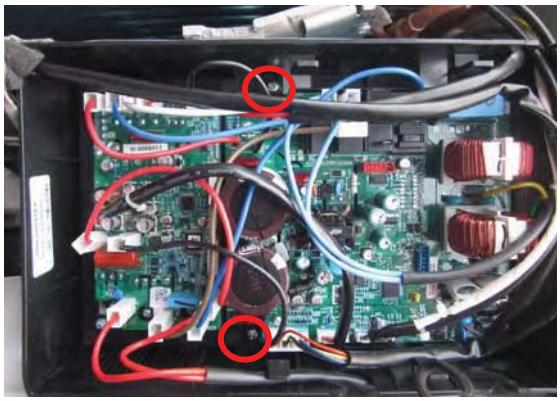


10) Unscrew the 4 screws on the side left grille and removed the left grille.

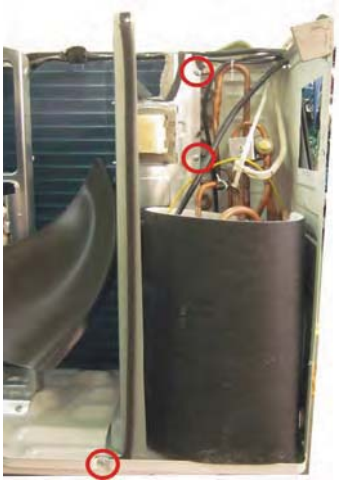


11) Remove the connectors and reactor in the control box.

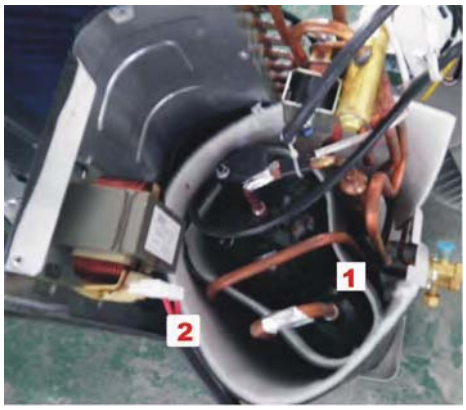
12)Remove the 2 screws fixed the control box.



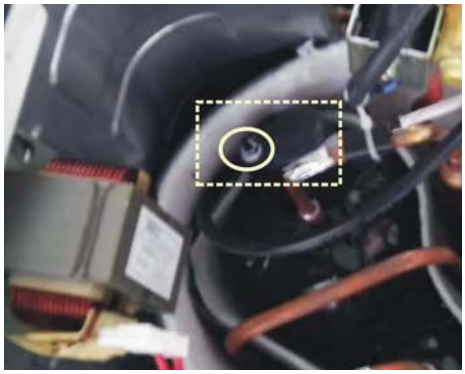
13) Remove the 3 screws fixed the bulkhead plate.



14) Remove the compressor covers 1 and 2.



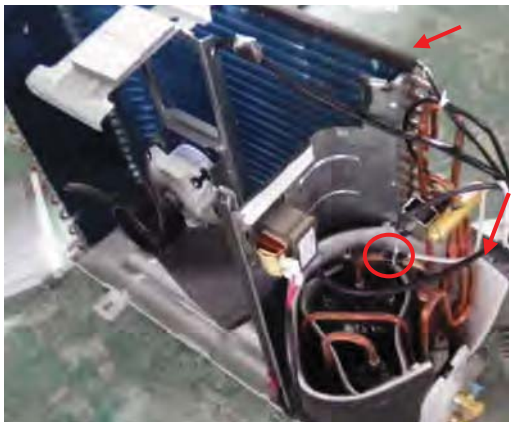
15) Remove the nut, and remove the terminal cover.



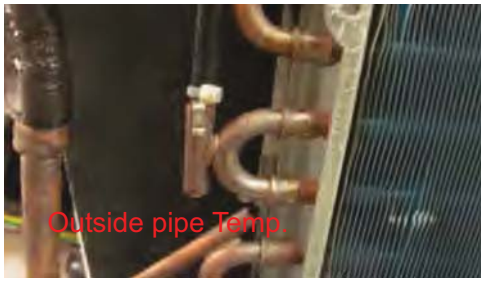
16) Remove the lead wire and the cover gasket.

17) Remove the compressor cover.

18) Remove the 3 thermistors.



19) Thermistor position.



20) Remove the outdoor fan.

19) Unscrew the 2 screws and remove the motor angle.

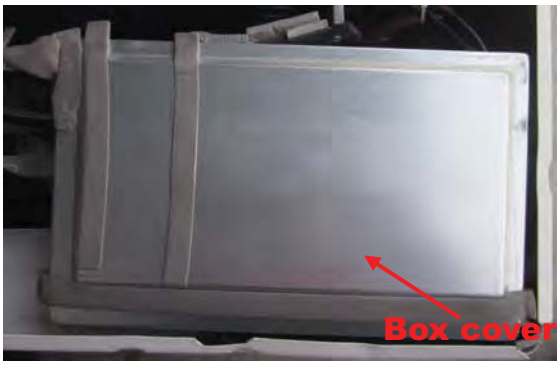
[3] CONTROL BOX

1.Control unit box's Approach to decomposition.

1) Take off lead wires from terminal assembly.
(Blue wire,Brown wire,Black wire)

2) Take off screw (earth).
Take off earth lead wire(green/yellow) from electronic box.

3) Take off box cover.



4) Take off screws 6 PCS)

CHAPTER7.INSTALLATION MANUL

SHARP

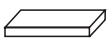
SPLIT TYPE ROOM AIR CONDITIONER
INSTALLATION MANUAL

INDOOR UNIT/OUTDOOR UNIT
AY-X9PSR/AE-X9PSR,AY-X12PSR/AE-X12PSR

SAFETY PRECAUTIONS

- **Installion must be made in accordance with the installation manual by qualified service personnel.**
  Incorrect work will cause electric shock, water leak, fire.
- **Be sure to use the attached accessories parts and specified parts for installation.**
  Use of other parts will cause electric shock, water leak, fire, the unit falling.
- **The appliance shall be installed in accordance with national wiring regulations.**
  Wrong connection can cause overheating or fire.
- **After installation has complete, check that there is no leakage of refrigerant gas.**
  If the refrigerant gas contact with fire, it may generate toxic gas.
- **Ventilate the room if refrigerant gas leakes during installation.**
  If the refrigerant gas contact with fire, it may generate toxic gas.
- **Use the specified electrical cable.**
  Make sure the cable is secured in place and that the terminals are free of any excess force from the cable. Otherwise overheating or fire may result.
- **Form the cable so that the control box cover, the cord holder and cable holder are not loose.**
  Otherwise overheating, fire or electric shock may result.
- **Tighten the flare nut with a torque wrench according to the specified method.**
  If the flare nut is tightened too hard, the flare nut may be broken after a long time and cause refrigerant gas leakage.
- **When installing the unit, take care not to enter air substance other than the specified refrigerant(R410A) in the refrigerant cycle.**
  Otherwise, it will cause burst and injury as a result of abnormal high pressure in the refrigerant cycle.
- **Be sure to connect the refrigerant pipe before running the compressor.**
  Otherwise, it will cause burst and injury as a result of abnormal high pressure in the refrigerant cycle.
- **Earth the unit.**
  Incomplete earth may cause electrical shock.
- **Install an earth leakage breaker to avoid electric shock in case of leak.**
  Use the current-activated, high-sensitivity, high-speed type breaker with a rated sensitivity current of below 30 mA and an operating time of below 0.1 second.
- **Arrange the drain hose to ensure smooth drainage.**
  Insufficient drainage may cause wetting of the room, furniture etc.
- **This room air conditioner uses refrigerant R410A.**
  Use the pipe, flare nut and tools exclusively for R410A.

ACCESSORIES

ITEMS	Q'ty	APPLICATION	ITEMS	Q'ty	APPLICATION	ITEMS	Q'ty	APPLICATION
1.MOUNTING PLATE	1	To mount the indoor unit on the wall.	5.DRY BATTERY	2	For the remote control AAA batteries.	9.PUTTY 	1	Sealing wall-through hole.
2.WALL PLUG	6	To fix the mounting plate with the long screws.	6.MANUALS	1	Installation manual	10.INSULATION CASING	1	
				1	Operation manual			
3.LONG SCREW	6	To fix the mounting plate with the wall plugs.	7.VINYL TAPE	1	Wire & pipe finishing	11.DRAIN PIPE CONNECTION	1	
4.REMOTE CONTROL	1	To control remotely.	8.DRAIN HOSE	1	Drainage			

NOTES ON LOCATIONS

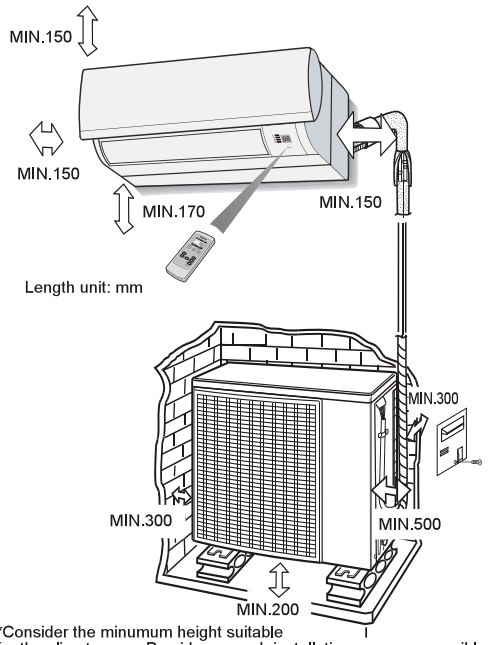
Indoor unit

1. Keep the air outlet clear of any obstacle so that outgoing air flows smoothly in the entire room.
2. Make a drain hose hole for easy drainage.
3. Provide sufficient space on both sides and above the unit.
4. The air filters should be easily taken in and out.
5. Keep TV set, radio and the like 1 m or more away from the unit and the remote control.
6. Keep the air inlet clear of obstacles that could block incoming air.
7. The remote control may not function properly in a room equipped with an electronic simultaneous-start or rapid-start fluorescent lighting.
8. Select a location that does not cause loud operation noise and extreme vibrations.

Outdoor unit

1. Place the outdoor unit on a stable base.
2. Provided sufficient space around the unit. It should also be well ventilated.
3. The unit should not be exposed to strong wind nor splashed with rain water.
4. Water drain from the unit should be let out without problem. Lay a drain hose if required. In cold regions, installation of the drain pipe is not advisable as freezing could result.
5. Keep TV set, radio and the like 1 m or more away from the unit.
6. Avoid locations exposed to machine oil vapor, salty air (facing the seashore, for example), hot spring vapor sulfur gas, etc. Such location can cause breakdown.
7. Avoid locations exposed to muddy water (along a road, for example) or where the unit can be tampered with.
8. Select a location where the outgoing air or operating noise cannot annoy others.
9. Keep the air outlet opening free of any obstacle. This could affect the performance of the unit and create loud noises.

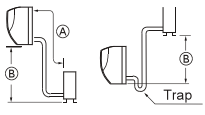
INSTALLATION DIAGRAM



*Consider the minumum height suitable for the climate area. Provide as much installation space as possible for efficient air-conditioning.

PIPING

Max. piping length:A	Max. height difference:B	Min. piping length	Additional refrigerant (piping length exceeds 5m)
15 m	5 m	1 m	AE-X9PSR 20 g/m
			AE-X12PSR 30 g/m



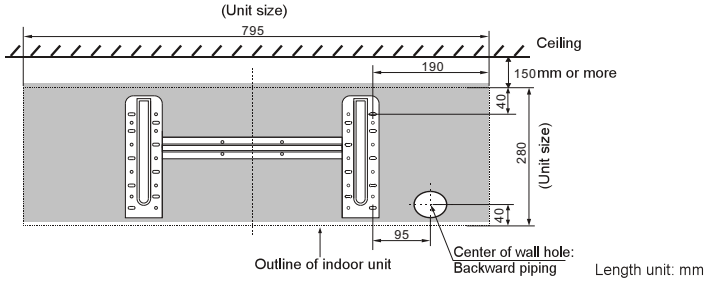
- Standard piping length is 5m.
- When the outdoor unit is placed at a higher level than the indoor unit, provide a trap near the hose's lead-in port.

Use the refrigerant pipes shown in the table below.

Pipe size		Pipe thickness	Thermal insulation
Liquid side	1/4" (ø 6.35mm)	0.5 mm	Thickness: 6 mm or thicker Material: Polyethylene foam
Gas side AY-X9PSR/AE-X9PSR	3/8" (ø 9.52 mm)	0.6 mm	
Gas side AY-X12PSR/AE-X12PSR	1/2" (ø 12 mm)		

- The thermal insulation should cover both the gas and liquid pipes.

INSTALLATION DIMENSION OF INDOOR UNIT



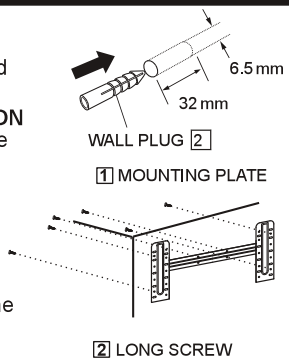
1 PLACING THE MOUNTING PLATE AND MAKING A PIPING HOLE

Installing the mounting plate

(1) Drill diameter 6.5mm, depth 32mm holes and fit the wall plug.

(2) Referring to the "**INSTALLATION DIMENSION OF INDOOR UNIT**", mark the location for the fixing holes and the piping hole.
- Recommended fixing holes are marked in circle around the hole. (6 points)
- Make sure that the mounting plate is horizontally.

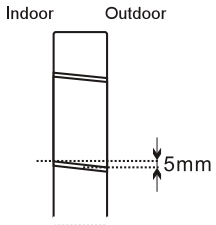
(3) Secure the mounting plate to the wall with the long screws and check the stiffness.



Making a piping hole

(1) Drill a piping hole with 70mm diameter concrete drill or a hole saw with a 5mm down ward slant to the outside.

(2) Set the sleeve and caps.

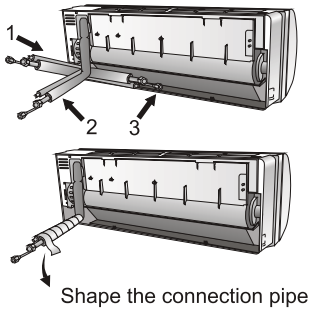


2 SETTING UP THE INDOOR UNIT

Refrigerant piping connection

(1) The piping can be run in the 3 directions indicated by numbers in the picture. When the piping is run in direction 1 or 3, cut a notch along the groove on the side of the indoor unit with a cutter.

(2) Run the piping in the direction of the wall hole and bind the copper pipes, the drain pipe and the power cables together with the tape with the drain pipe at the bottom, so that water can flow freely.



For left rear piping

A. Route the indoor tubing with the drain hose to the required piping hole position.

B. Insert the piping, drain hose and the connecting cable into the piping hole.

C. Insert the connecting cable into the indoor unit.

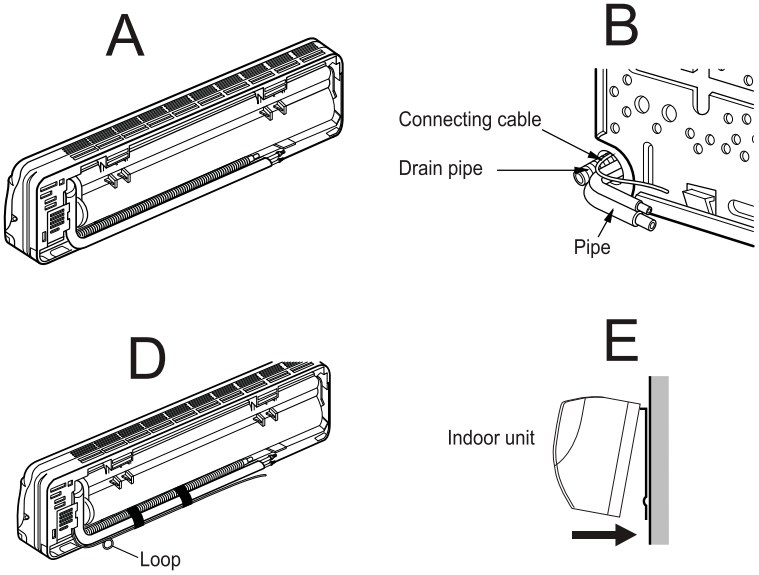
1) Don't connect the cable to the indoor unit.

2) Make a small loop with the cable for easy connection later.

D. Tape the tubing, drain hose and the connecting cable.

E. Indoor unit installation

Hang the indoor unit from the hooks at the top of the installation plate.



3 CONNECTING THE CABLE TO THE INDOOR UNIT

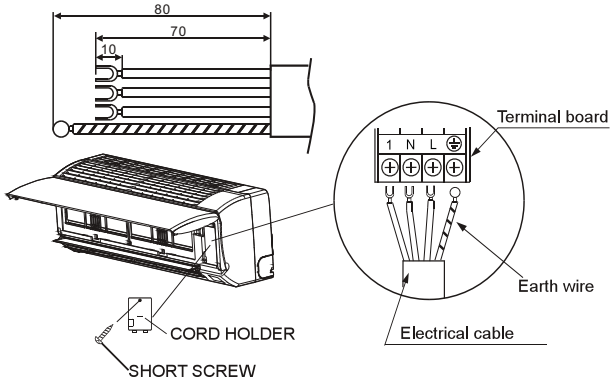
(1) Process the end of the electrical cable for the indoor side.
- Use a copper cable. (Cross-section area 1.5mm^2 or more)
- Use a cable which is not lighter than polychloroprene sheathed flexible cord (design 245 IEC 57).

(2) Open the open panel by about 50°.

(3) Connect the electrical cable.
- Be very careful not to confuse the terminal connections. Wrong cabling may damage the internal control circuit.
- The markings on the indoor unit's terminal board must match with those of the outdoor unit.

(4) Fix the cable with the accompanying cord holder and the short screw.

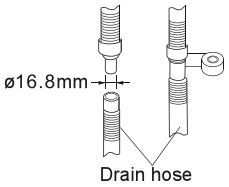
(5) Close the open panel.



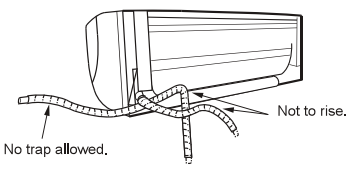
4 CONNECTING THE DRAIN HOSE

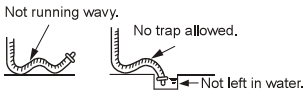
Indoor unit

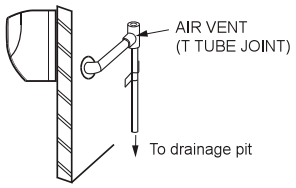
(1) Connect a drain hose.
(2) Tape over the connecting part.



Notes:
- Be sure to lay the drain hose downward for smooth drainflow.
- Be careful not to allow the drain hose to rise, form a trap or leave its end in water, as shown below.
- Coil thermal insulation around a drain hose extension, if running in the room.
- It is recommended to add an "intermediate air vent" when the drain hose is extended horizontally, or an "anti-back-flow air vent" when the hose is exposed to high winds on a high-rise building, for example. For this purpose, employ a "T tube joint" (PVC-made, commercially available) halfway in the hose.

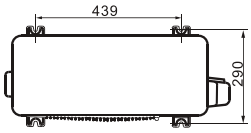






5 OUTDOOR UNIT INSTALLATION

Referring to the figure, firmly fasten the outdoor unit with bolts.



Length unit: mm

6 CONNECTING THE REFRIGERANT PIPES

- Use pipes with thickness 0.8mm.
- Connect the pipes for the indoor unit first and then for the outdoor unit.
- Bend the pipes carefully as not to damage them.
- Do not over tighten the tubes; it may be de-formed or damaged.
  Use a torque wrench, when possible. See the table below for the flare nut tightening torque.

Flare nut tightening torque

Pipe size		Torque
Liquid side	1/4"	16±2 N·m (1.6±0.2 kgf·m)
Gas side AY-X9PSR/AE-X9PSR	3/8"	38±4 N·m (3.8±0.4 kgf·m)
Gas side AY-X12PSR/AE-X12PSR	1/2"	

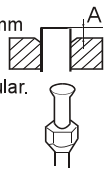
Flaring the pipe end

(1) Cutting with a pipe cutter
Cut at a right angle.

(2) Deburring
Allow no cuttings in the pipe.

(3) Putting in the flare nut

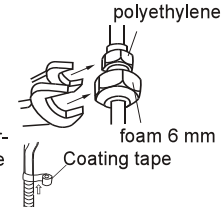
(4) Flaring
Flare processing dimensions(:A) differ according to the type of flare tool.
R410A tool: 0-0.5mm
Conventional tool: 1.0-1.5mm

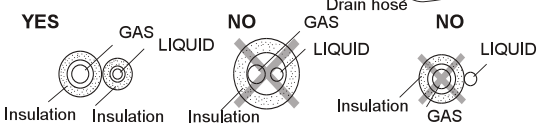


(5) Checking
To be flared perfectly circular.
Flare nut not missing.

Connecting the pipes

(1) Tighten the flare nuts by hand for the first 3-4 turns.
(2) Use two wrenches to tighten up the pipes.
(3) Wind coating tape around refriger-ant pipes together with drain hose and electrical cable for general.
- Lay the drain hose below the pipes.
- The thermal insulation should cover both the GAS and LIQUID pipes as shown below. As insulation,



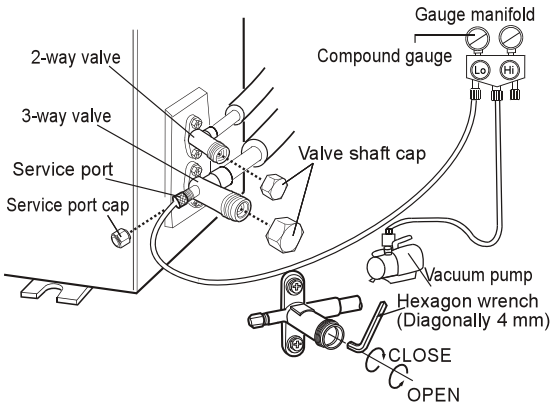


7 AIR REMOVAL

Use a vacuum pump, gauge manifold and hoses exclusively for R410A.

(1) Remove both valve shaft caps of the 2 and 3-way valves.
(2) Remove the service port cap of the 3-way valve.
(3) Connect the gauge manifold hose to the service port and the vacuum pump.
Be sure that the hose end to be connected to the service port has a valve core pusher.
(4) Open the gauge manifold low-pressure valve(Lo) and operate the vacuum pump for 10-15 minutes.
Make sure the compound gauge reads -0.1 MPa(-76 cmHg).
(5) Close the gauge manifold valve.
(6) Turn off the vacuum pump.
Leave as it for 1-2 minutes and make sure the needle of the compound gauge does not go back.
(7) Open the 2-way valve 90° counterclockwise by turning the hexagon wrench.
Close it after 5 second, and check for gas leakage.*
(8) Disconnect the gauge manifold hose from the service port.
(9) Fully open the 2-way valve with hexagon wrench.
(10) Fully open the 3-way valve with hexagon wrench.
(11) Firmly tighten the service port cap and both valve shaft caps with a torque wrench at the specified tightening torque.

* Check the pipe connections for gas leak using a leakage detector or soapy water. Regarding leakage detector, use high-sensitivity type designed specially for R410A.



Valve shaft cap tightening torque

Pipe size		Torque
Liquid side	1/4"	24±3 N · m (2.4±0.3 kgf · m)
Gas side AY-X9PSR/AE-X9PSR	3/8"	
Gas side AY-X12PSR/AE-X12PSR	1/2"	

Service port cap tightening torque

Torque
11±1 N · m (1.1±0.1 kgf · m)

8 CONNECTING THE CABLE TO THE OUTDOOR UNIT

(1) Process the end of the connecting cable for the outdoor unit.
- Use a copper cable.
- Use a cable which is not lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC 57).

(2) Remove the control box cover.

(3) Remove the cable holder and connect the cables.
Be sure that the terminal connections are as specified.

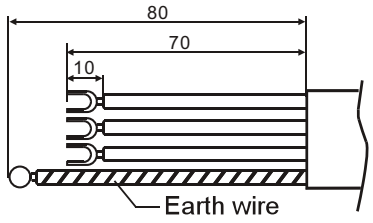
(4) Fix the cable sheaths with the cable holder and the screw firmly.

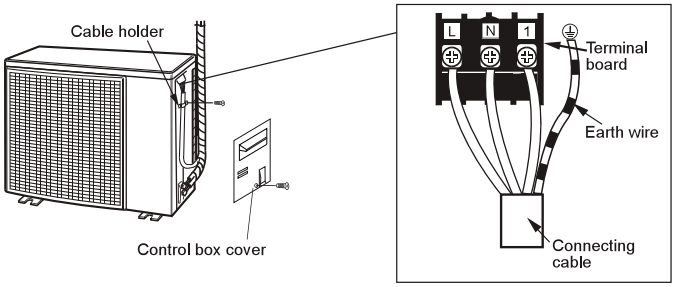
(5) Double-check that the cables are securely in place.

(6) Place the control box cover back in the reverse order.

Caution:
- Be sure to put the cable leads deep into the terminal board and tighten up the screws. Poor contact can cause overheating or fire, or malfunction.

Connecting cable
(Cross-section area: 1.5 mm^2)





9 POWER CABLING

Prepare a dedicated power supply circuit.

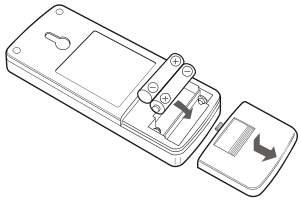
Supply power	220 V - 240 V, single-phase
Circuit breaker	16 A

- Fit a disconnect switch, having a contact separation of at least 3mm in all poles, to the electricity power line.

10 REMOTE CONTROL INSTALLATION

Loading the batteries

Slide the cover in the direction of the arrow.
(1) Open the cover.
(2) Insert the batteries.
(3) Close the cover.
- If after battery replacement the control fails to function, take out the batteries. Wait for more than 30 seconds and put them in again.



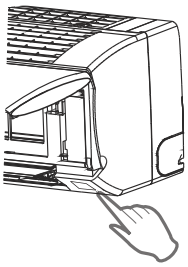
11 TEST RUN

(1) Start operation with remote control or by pressing the "ON/OFF" button on the unit.

(2) Turn the unit to COOLING mode at 27℃, then set fan speed to high.

(3) Press the Full Power button 6 times rapidly and you will hear the unit ringing for 4 times. Now the unit is running in cooling test run mode.

(4) Make sure the system runs well. Then stop the unit by pressing the "ON/OFF" button again or using remote control.



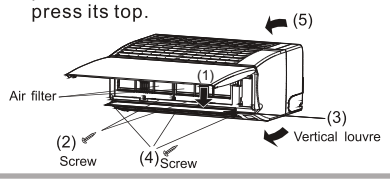
12 ITEMS TO CHECK

☐ Is the specified power supply voltage used?
☐ Is the connecting cable fixed to terminal board firmly?
☐ Is the earth wire connected properly arranged?
☐ Is the drainage properly?
☐ Is the indoor unit hooked to the mounting plate firmly?
☐ Is there any gas leakage at the pipe connection?

EXPLANATION TO CUSTOMER
- Explain to the customer how to use and maintain the system, referring to the operation manual.
- Ask the customer to carefully read the operation manual.
When the system has been set up, hand the installation manual to the customer

DETACHING THE FRONT PANEL

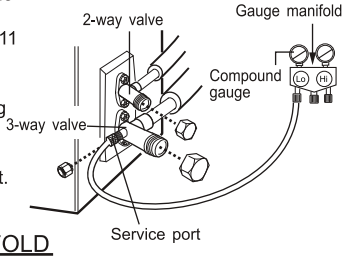
For servicing ,for example,detach the front panel in the following steps. Be sure to disconnect the power cord from the wall outlet or turn off the circuit breaker.
(1) Remove the air filter.
(2) Unscrew the 2 screws of the front panel.
(3) Adjust the vertical louvre to reveal the 3 screw covers.
(4) Pull out 3 screw covers with tweezers or other tool, then unscrew 3 screws hide inside.
(5) Extract 4 hooks along the upper surface for disassembly, then slightly open the upper part of front panel.
Caution: The display panel is connected with control box by a flat cable. It should also be detached in case that malfunction occurs.
(6)To set the panel back into position, press-fit it at the bottom first and then press its top.



PUMP DOWN

Pump down is adopted in the case of unit removal for re-installation, abandonment, repair etc.
Pump down is to collect the refrigerant into the outdoor unit.

PROCEDURE USING GAUGE MANIFOLD (Recommended procedure)
(1) Connect the gauge manifold hose to the service port of the 3-way valve.
(2) Run the air conditioner at cooling test run mode (Refer to11 TEST RUN).
(3) After 5 - 10 minutes,close the 2-way valve.
(4) Close the 3-way valve when the compound gauge reading becomes almost 0 MPa(0 cmHg).
(5) Stop the test run operation.
(6) Disconnect the gauge manifold hose from the service port.
(7) Disconnect both refrigerant pipes.



PROCEDURE WITHOUT USING GAUGE MANIFOLD
(1) Run the air conditioner at cooling test run mode (Refer to 11 TEST RUN).
(2) After 5-10 minutes, fully close the 2-way valve by turning the hexagon wrench.
(3) After 2-3 minutes, immediately close the 3-way valve fully.
(4) Stop the test run operation.
(5) Disconnect both refrigerant pipes.

Caution:
- Make sure that the compressor is turned off before removing the refrigerant pipes. Otherwise, it will cause burst and injury.
- Do not perform PUMP DOWN when refrigerant is leaking or there is no refrigerant in the refrigerant cycle. Otherwise, it will cause burst and injury

CHAPTER 6. OPERATION MANUAL

USING THE REMOTE CONTROL

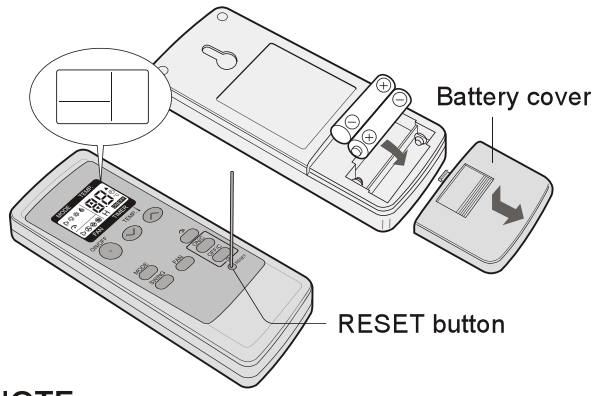
LOADING BATTERIES

1 Remove the battery cover.

2 Insert two batteries. (AAA(R03))
Make sure the (+) and (-) polarities are correctly aligned.

3 Reinstall the battery cover.

4 Press the RESET button using a thin stick.



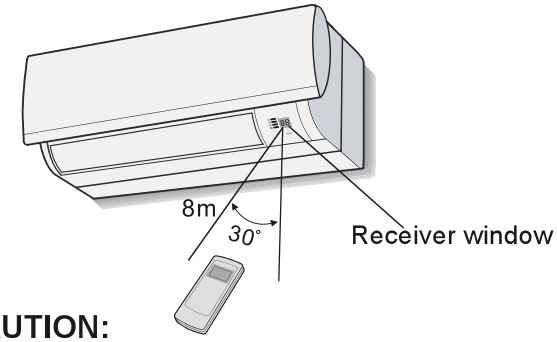
NOTE:

- The battery life is approximately 1 year in normal use.
- When replacing the batteries, always change both and use the same type.
- If you will not be using the unit for a long time, remove the batteries from the remote control.

HOW TO USE THE REMOTE CONTROL

Point the remote control towards the receiver window and press the desired button. The unit generates a beep when it receives the signal.

- Make sure nothing, such as curtains, block the signal receiver window.
- The signal effective distance is 8 m.



CAUTION:

- Do not expose the receiver window to direct sunlight. This may adversely affect its operation.
- Use of certain fluorescent lamp in the same room may interfere with transmission of the signal.
- Do not leave the remote control in direct sunlight or near a heater. Protect the remote control from moisture and shock.

ON / OFF MODE

Use this mode when the remote control is not available.

TO TURN ON

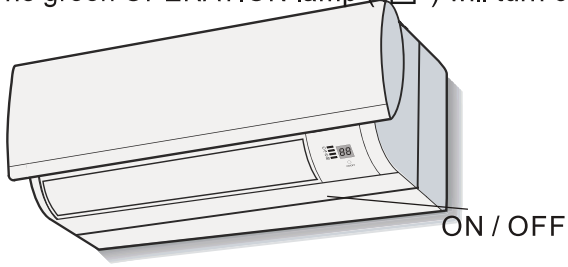
Press the ON / OFF button.

- The green OPERATION lamp (▤) will light up and the unit will start operating in the AUTO mode.
- The fan speed and temperature setting are set to AUTO.

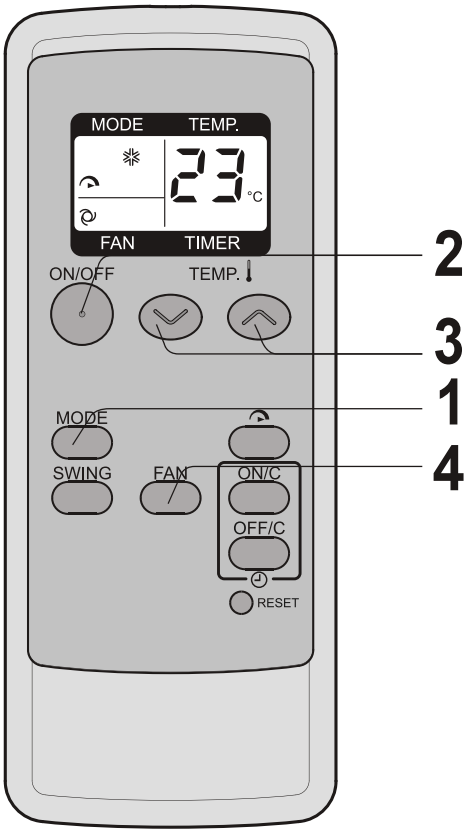
TO TURN OFF

Press the ON / OFF button again.

- The green OPERATION lamp (▤) will turn off.



BASIC OPERATION



1 Press the MODE button to select the operation mode.

AUTO → HEAT → COOL → DRY

2 Press the ON/OFF button to start operation.

- The green OPERATION lamp (▤) will light up.

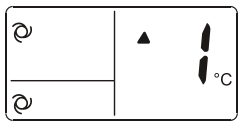
TO TURN OFF

Press the ON/OFF button again.

- The green OPERATION lamp (▤) will turn off.

3 Press the TEMPERATURE button to set the desired temperature.

(AUTO/DRY mode)
The temperature can be changed up to ±2 °C the automatically set of temperature.



(COOL/HEAT mode)
The temperature setting range:18-32 °C.

4 Press the FAN button to set the desired fan speed.

AUTO → SOFT → LOW → HIGH

NOTE:

AUTO MODE
In the AUTO mode, the temperature setting and mode are automatically selected according to the room temperature and outdoor temperature when the unit is turned on.
During operation, if the outdoor temperature changes, the temperature settings will automatically change.

DRY MODE
The fan speed is preset to AUTO and cannot be changed.

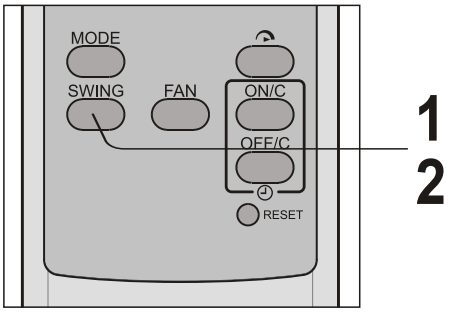
ADJUSTING THE AIR FLOW DIRECTION

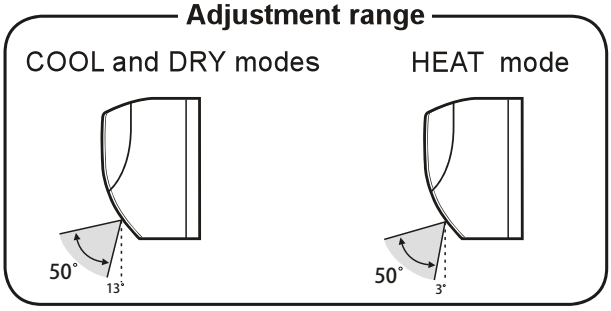
VERTICAL AIR FLOW DIRECTION

1 Press the SWING button.

- The vertical airflow louvre will swing.

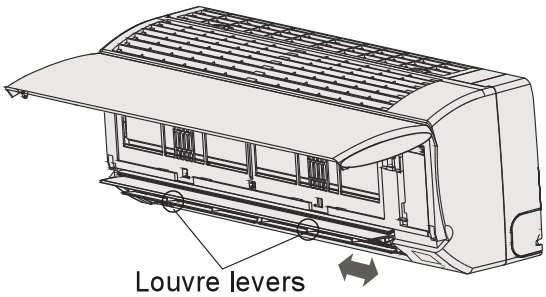
2 Press the SWING button again to stop at the desired position.





HORIZONTAL AIR FLOW DIRECTION

Adjust the horizontal air flow direction with the louver lever.



CAUTION:

Never attempt to adjust the vertical airflow louvre manually.

- Manual adjustment of the vertical airflow louvre can cause the unit to malfunction.
- When the vertical adjustment louvre is positioned at the lowest position in the COOL or DRY mode for an extended period of time, condensation may result.

FULL POWER OPERATION

The air conditioner works at the maximum power to make the room cool or warm rapidly.

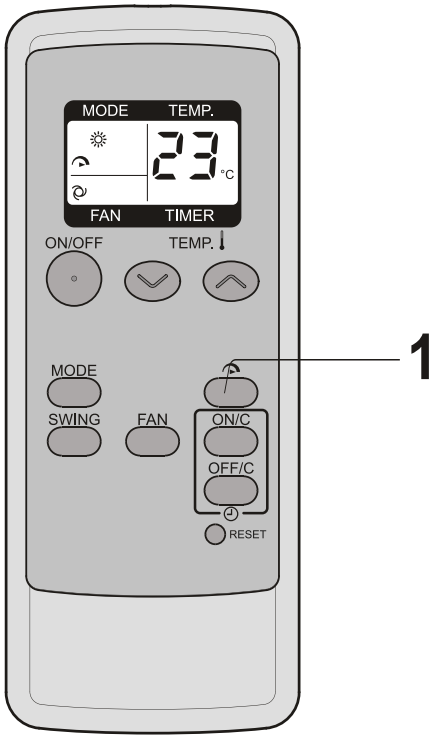
1 During cooling and heating operation, press the FULL POWER button.

- The remote control will display "".
- The yellow FULL POWER lamp () will light up.

TO CANCEL

Press the FULL POWER button again.

- The yellow FULL POWER lamp () will turn off.



NOTE:

- The air conditioner will operate at "Extra HIGH" fan speed for 5 minutes, and then shift to "HIGH" fan speed.
- You can set the temperature during the FULL POWER operation.

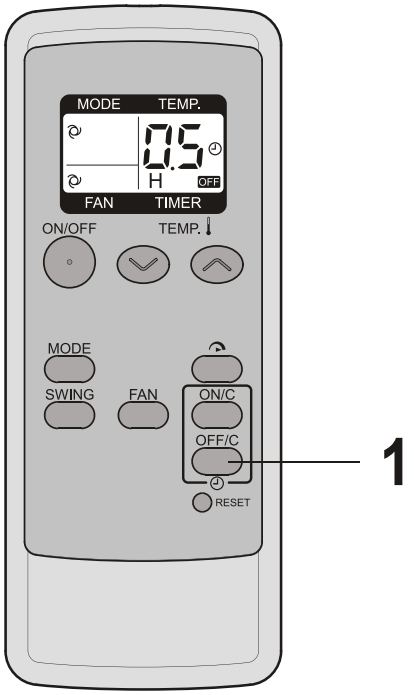
TIMER OPERATION

TIMER OFF

1 Press the TIMER OFF button and set the time as desired.

0.5h → 1.0h → 1.5h ··· → 10h → 11h → 12h

- The yellow TIMER lamp ( ) will light up.
- The time setting will count down to show the remaining time.



TIMER ON

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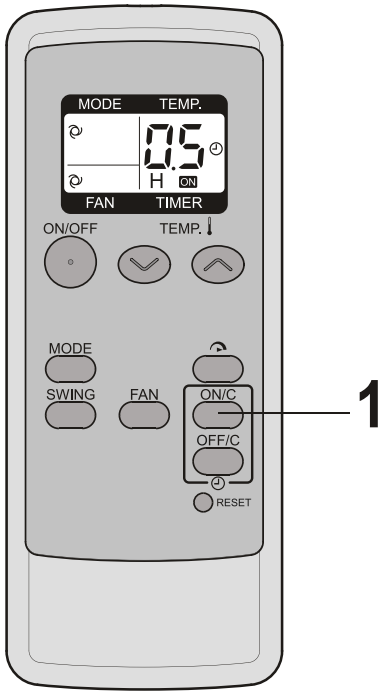

NOTE:

- Timer duration can be set from a minimum half an hour to a maximum of 12 hours. Up to 9.5 hours, you can set in half-hour increments, and from 10 to 12 hours, in 1-hour increments.
- The TIMER OFF and TIMER ON can not be set together.
- When the temperature is set during timer setting, the temperature will show in the display for 5 seconds and then return to the timer display.

TIPS ON SAVING ENERGY

Below are some simple ways to save energy when you use your air conditioner.

Set the proper temperature

- Setting to higher or lower than necessary temperature point will result in increased power consumption.

Block direct sunlight and prevent drafts

- Blocking direct sunlight during cooling operation will reduce power consumption.
- Close the windows and doors during cooling and heating operations.

Keep filter clean to ensure the most efficient operation

Turn off the circuit breaker when the unit is not used for an extended period of time

- The indoor unit still consumes a small amount of power when it is not operating.

NOTE ON OPERATION

OPERATING CONDITION

		INDOOR TEMP.	OUTDOOR TEMP.
COOLING	Upper limit	–	46 ˚C
	Lower limit	21 ˚C	18 ˚C
HEATING	Upper limit	27 ˚C	24 ˚C
	Lower limit	–	–7 ˚C

- The built-in protective device may prevent the unit from operating when used at higher temperature than this range.
- Condensation may form on the air outlet if the unit operates continuously in the COOL or DRY mode when humidity is over 80 %.

WHEN POWER FAILURE OCCURS

- This air conditioner has a memory function to store settings when a power failure occurs. After power recovery, the unit will automatically re-start in the same settings which were active before the power failure, except for timer settings.
- If a power failure occurs while the timer is set, the timer setting will be cancelled and will not be retrieved even after the power is restored.

NOTE ON HEATING OPERATION

DEFROSTING FUNCTION

- When frost forms on the outdoor unit during heating operation, the unit operate automatic defrosting for about 5 to 10 minutes to remove the frost. During defrosting, the inside and outside fans stop operating.

HEATING EFFICIENCY

- The unit employs a heat pump that draws heat from the outside air and releases it into the room. The outside temperature therefore greatly affects the heating efficiency.
- If the heating efficiency is reduced due to low outside temperatures, use an additional heater.
- It takes time to warm up and heat the entire room because of the forced air circulation system.

PARTS GUIDE

ROOM AIR CONDITIONER

MODEL

INDOOR UNIT **AY-X9PSR**
AY-X12PSR

OUTDOOR UNIT **AE-X9PSR**
AE-X12PSR

CONTENTS

[1] INDOOR UNIT PARTS
[2] ACCESSORY PARTS
[3] INDOOR PACKING PARTS
[4] OUTDOOR UNIT PARTS
[5] OUTDOOR PACKING PARTS

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

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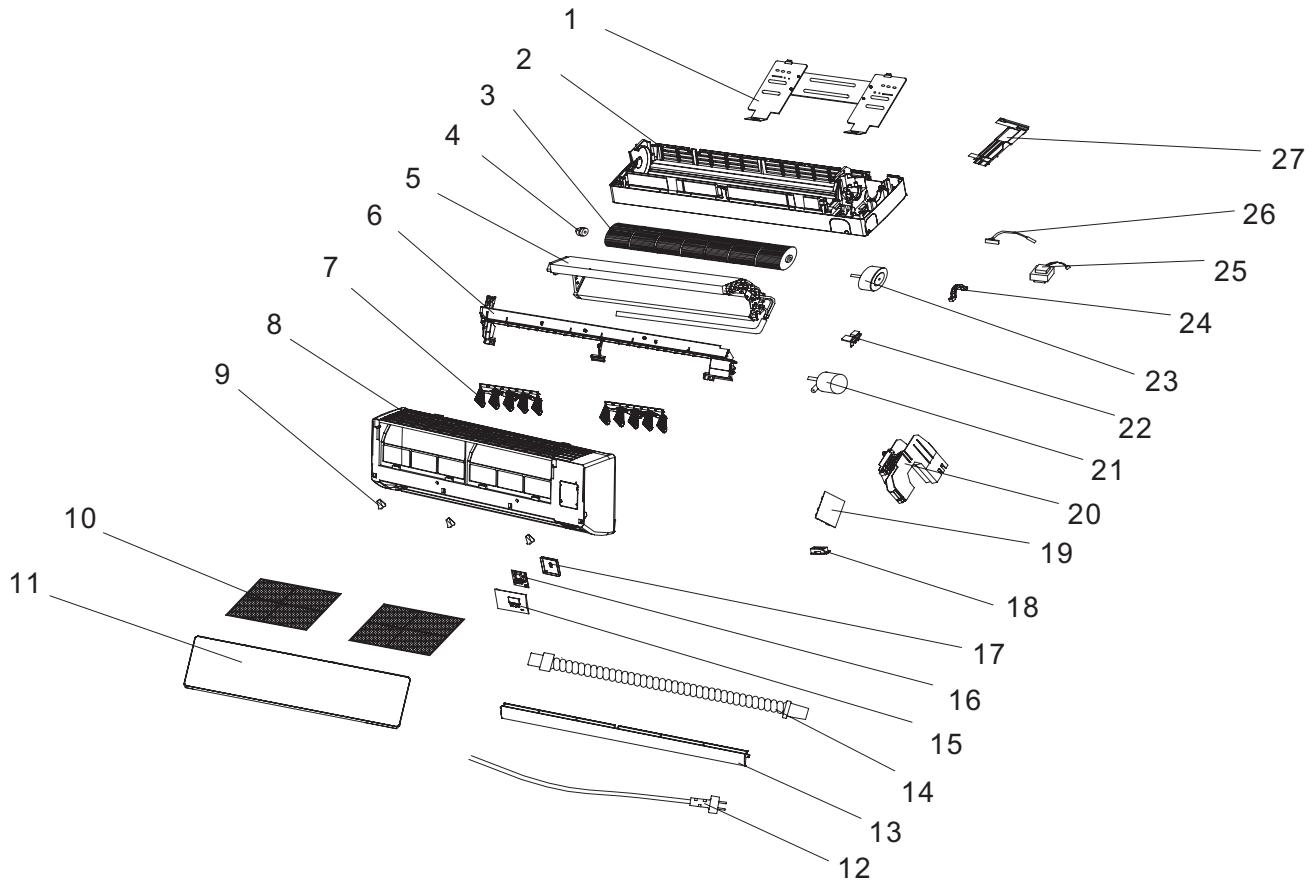
The contents are subject to change without notice.

[1] INDOOR UNIT PARTS

AY-X9PSR/AY-X12PSR



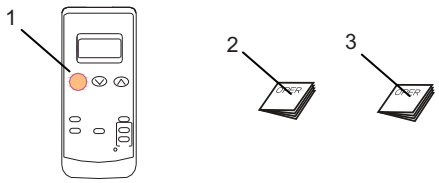
AY-X9PSR

No.	Part No.	Part Name	Q'ty	Remark
1	PPLTNA161JBWZ	Installation Plate	1	
2	LCHS-A674JBFA	Base	1	
3	NFANCA155JBKZ	Cross Fan	1	
4	NBRG-A075JBEZ	Bearing Mount	1	
5	DEVA-A582JBKZ	Evaporator	1	
6	CSRA-A896JBKZ	Water Drainage Assembly	1	
7	MLOV-A588JBFA	Vertical Vane Assembly	2	
8	GWAK-A420JBFA	Face Frame	1	
9	LHLD-B288JBFA	Screw Cover	3	
10	PFILMA289JBEA	Air Filter	2	
11	HPNL-B314JBRA	Front Panel	1	
12	QACC-A362JBZZ	Power Supply Cord	1	
13	MLOV-A589JBFA	Vane	1	
14	PHOS-A067JBEZ	Drainage Hose	1	
15	CDECQA084JBKZ	Display PCB Cover	1	
16	RLCDSA127JBZZ	Display PCB	1	
17	HDECQA533JBFA	Display PCB Box	1	
18	LHLD-B289JBFA	Cable Clamp	1	
19	DSGY-F199JBKZ	Main PCB	1	
20	DBOX-A156JBKZ	Electrical Box	1	
21	CMOTLB546JBEZ	Vane Motor	1	
22	LHLD-B290JBFZ	Sensor Holder	1	
23	CMOTLB547JBEZ	Indoor Motor	1	
24	PCOV-C123JBFZ	Indoor Motor Cover	1	
25	RTRNWA070JBZZ	Transformer	1	
26	RH-HXA191JBZZ	Indoor Sensor Assembly	1	
27	PCOV-C124JBFZ	In And Out Pipe Fixer	1	

AY-X12PSR

No.	Part No.	Part Name	Q'ty	Remark
1	PPLTNA161JBWZ	Installation Plate	1	
2	LCHS-A674JBFA	Base	1	
3	NFANCA155JBKZ	Cross Fan	1	
4	NBRG-A075JBEZ	Bearing Mount	1	
5	DEVA-A583JBKZ	Evaporator	1	
6	CSRA-A896JBKZ	Water Drainage Assembly	1	
7	MLOV-A588JBFA	Vertical Vane Assembly	2	
8	GWAK-A420JBFA	Face Frame	1	
9	LHLD-B288JBFA	Screw Cover	3	
10	PFILMA289JBEA	Air Filter	2	
11	HPNL-B314JBRA	Front Panel	1	
12	QACC-A362JBZZ	Power Supply Cord	1	
13	MLOV-A589JBFA	Vane	1	
14	PHOS-A067JBEZ	Drainage Hose	1	
15	CDECQA084JBFA	Display PCB Cover	1	
16	RLCDSA127JBZZ	Display PCB(Digital)	1	
17	HDECQA533JBFA	Display PCB Box	1	
18	LHLD-B289JBFA	Cable Clamp	1	
19	DSGY-F199JBKZ	Main PCB(Digital)	1	
20	DBOX-A156JBKZ	Electrical Box	1	
21	CMOTLB546JBEZ	Vane Motor	1	
22	LHLD-B290JBFZ	Sensor Holder	1	
23	CMOTLB547JBEZ	Indoor Motor	1	
24	PCOV-C123JBFZ	Indoor Motor Cover	1	
25	RTRNWA070JBZZ	Transformer	1	
26	RH-HXA191JBZZ	Indoor Sensor Assembly	1	
27	PCOV-C124JBFZ	In And Out Pipe Fixer	1	

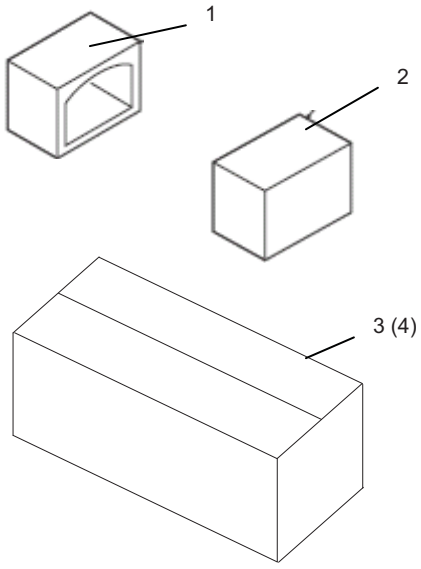
[2] ACCESSORY PARTS



ACCESSORY PARTS

No.	Part No.	Part Name	Q'ty	Remark
1	CRMC-A891JBEZ	REMOTE CONTROL	1	
2	TINSJB281JBRZ	INSTALLTION MANUAL	1	
3	TINSJB280JBRZ	OPERATION MANUAL	1	

[3] INDOOR UNIT PARTS



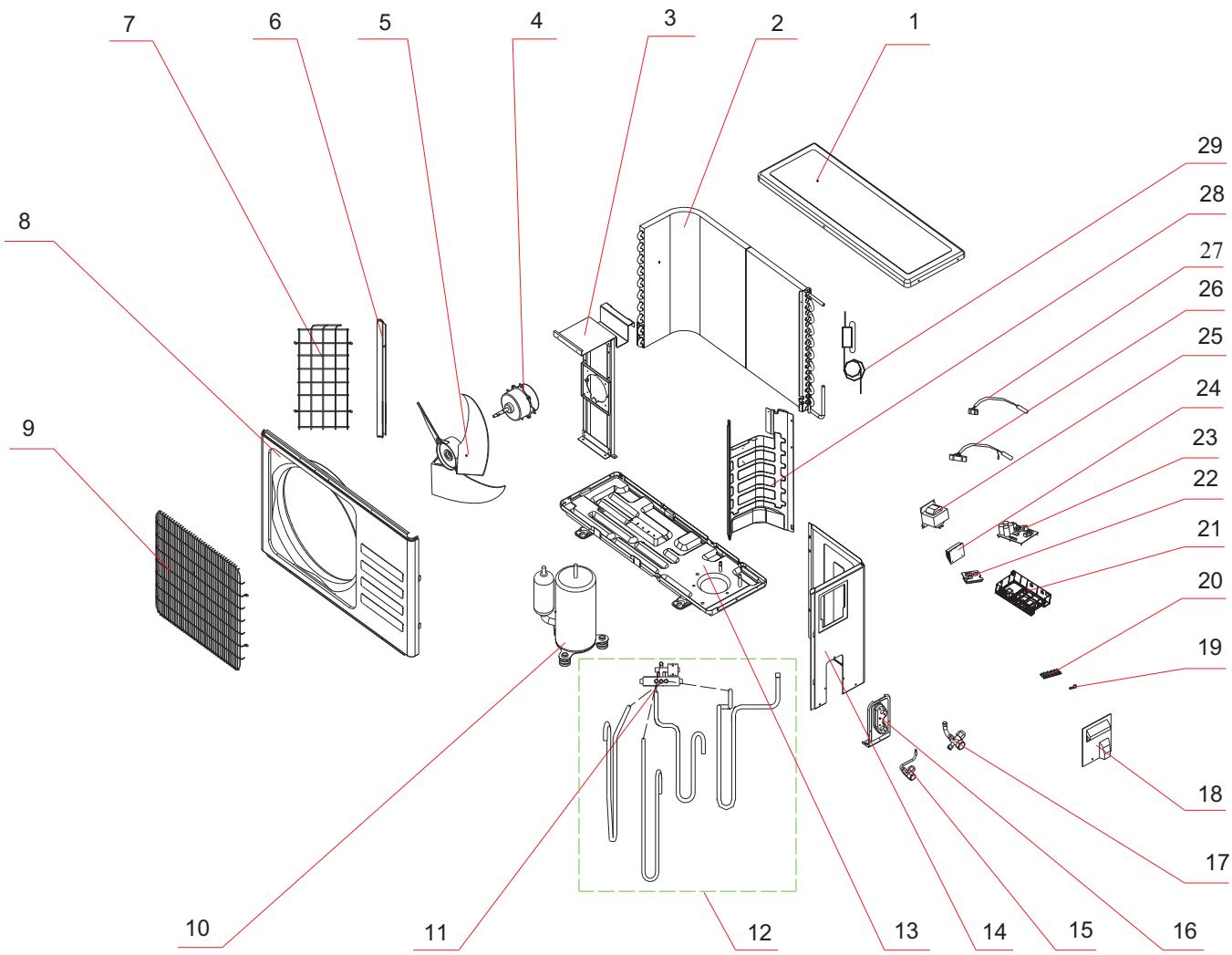
t Foaming

INDOOR PACKING PARTS

No.	Part No.	Part Name	Q'ty	Remark
1	SPADBA703JBEZ	Left Foaming	1	
2	SPADBA703JBEZ	Right Foaming	1	
3	SPAKCE433JBEZ	Indoor Carton	1	for AY-X9PSR
4	SPAKCE466JBEZ	Indoor Carton	1	for AY-X12PSR

[4] OUTDOOR UNIT PARTS

AE-X9PSR/AE-X12PSR



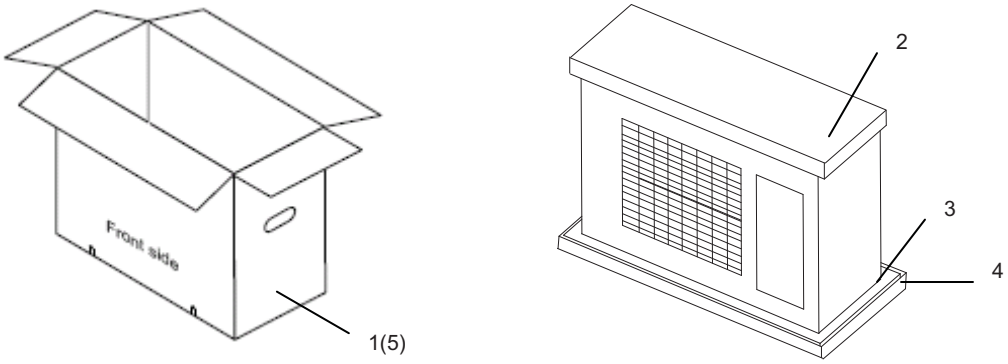
AE-X9PSR

No.	Part No.	Part Name	Q'ty	Remark
1	CCAB-A597JBKZ	Top cover	1	
2	DCoN-A784JBPZ	Condenser	1	
3	LANGKA345JBPZ	Outdoor motor supporter	1	
4	CMoTLB548JBEZ	Outdoor motor	1	
5	NFANPA154JBEZ	Propeller fan	1	
6	PPLT-A990JBTA	Left grille supporter	1	
7	GGADUA015JBEA	Left grille	1	
8	GCAB-A486JBTA	Front plate	1	
9	GGADPA028JBFA	Fan guard	1	
10	FCMPRA374JBKZ	Compressor and accessories	1	
11	FVLV-A301JBKZ	4-way valve	1	
12	CVLV-B263JBKZ	4-way valve assembly	1	
13	CCHS-B413JBYZ	Base	1	
14	PPLT-A991JBTA	Right plate	1	
15	DVLV-B426JBKZ	Two-way valve	1	
16	PPLT-A992JBPZ	Valve supporter	1	
17	DVLV-B425JBKZ	Three-way valve	1	
18	JHNDPA035JBFA	Electrical box cover	1	
19	LHLD-AA01SRFZ	Cable clamp	1	
20	PDAi-A304JBWZ	Terminal	1	
21	PBoX-A604JBPZ	Electrical box	1	this is assembly
22	QTANZA097JBZZ	Power source board	1	
23	DSGY-F210JBKZ	Inverter module	1	
24	LANGKA344JBPZ	Radiator	1	
25	RCiLZA059JBZZ	Inductor	1	
26	RH-HXA194JBZZ	Pipe Temp. sensor and outdoor Temp. sensor	1	
27	RH-HXA195JBZZ	Discharge Temp. sensor	1	
28	PSKR-A423JBPZ	Partition plate	1	
29	CCPY-A333JBKZ	Capillary assembly	1	

AE-X12PSR

No.	Part No.	Part Name	Q'ty	Remark
1	CCAB-A597JBKZ	Top cover	1	
2	DCON-A785JBPZ	Condenser	1	
3	LANGKA345JBPZ	Outdoor motor supporter	1	
4	CMOTLB548JBEZ	Outdoor motor	1	
5	NFANPA154JBEZ	Propeller fan	1	
6	PPLT-A990JBTA	Left grille supporter	1	
7	GGADUA015JBEA	Left grille	1	
8	GCAB-A486JBTA	Front plate	1	
9	GGADPA028JBFA	Fan guard	1	
10	FCMPRA375JBKZ	Compressor and accessories	1	
11	FVLV-A301JBKZ	4-way valve	1	
12	CVLV-B264JBKZ	4-way valve assembly	1	
13	CCHS-B413JBYZ	Base	1	
14	PPLT-A991JBTA	Right plate	1	
15	DVLV-B426JBKZ	Two-way valve	1	
16	PPLT-A992JBPZ	Valve supporter	1	
17	DVLV-B427JBKZ	Three-way valve	1	
18	JHNDPA035JBFA	Electrical box cover	1	
19	LHLD-AA01SRFZ	Cable clamp	1	
20	PDAI-A304JBWZ	Terminal	1	
21	PBOX-A604JBPZ	Electrical box	1	this is assembly
22	QTANZA098JBZZ	Power source board	1	
23	DSGY-F210JBKZ	Inverter module	1	
24	LANGKA344JBPZ	Radiator	1	
25	RCiLZA059JBZZ	Inductor	1	
26	RH-HXA194JBZZ	Pipe Temp. sensor and outdoor Temp. sensor	1	
27	RH-HXA195JBZZ	Discharge Temp. sensor	1	
28	PSKR-A423JBPZ	Partition plate	1	
29	CCPY-A334JBKZ	Capillary assembly	1	

[5] OUTDOOR PACKING PARTS



PACKING PARTS

No.	Part No.	Part Name	Q'ty	Remark
1	SPAKCE434JBEZ	Cabinet carton	1	for AE-X9PSR
2	SPADBA706JBFZ	Cover foaming	1	
3	SPADBA705JBFZ	Base foaming	1	
4	SPAKCE435JBEZ	Base carton	1	
5	SPAKCE468JBEZ	Cabinet carton	1	for AE-X12PSR